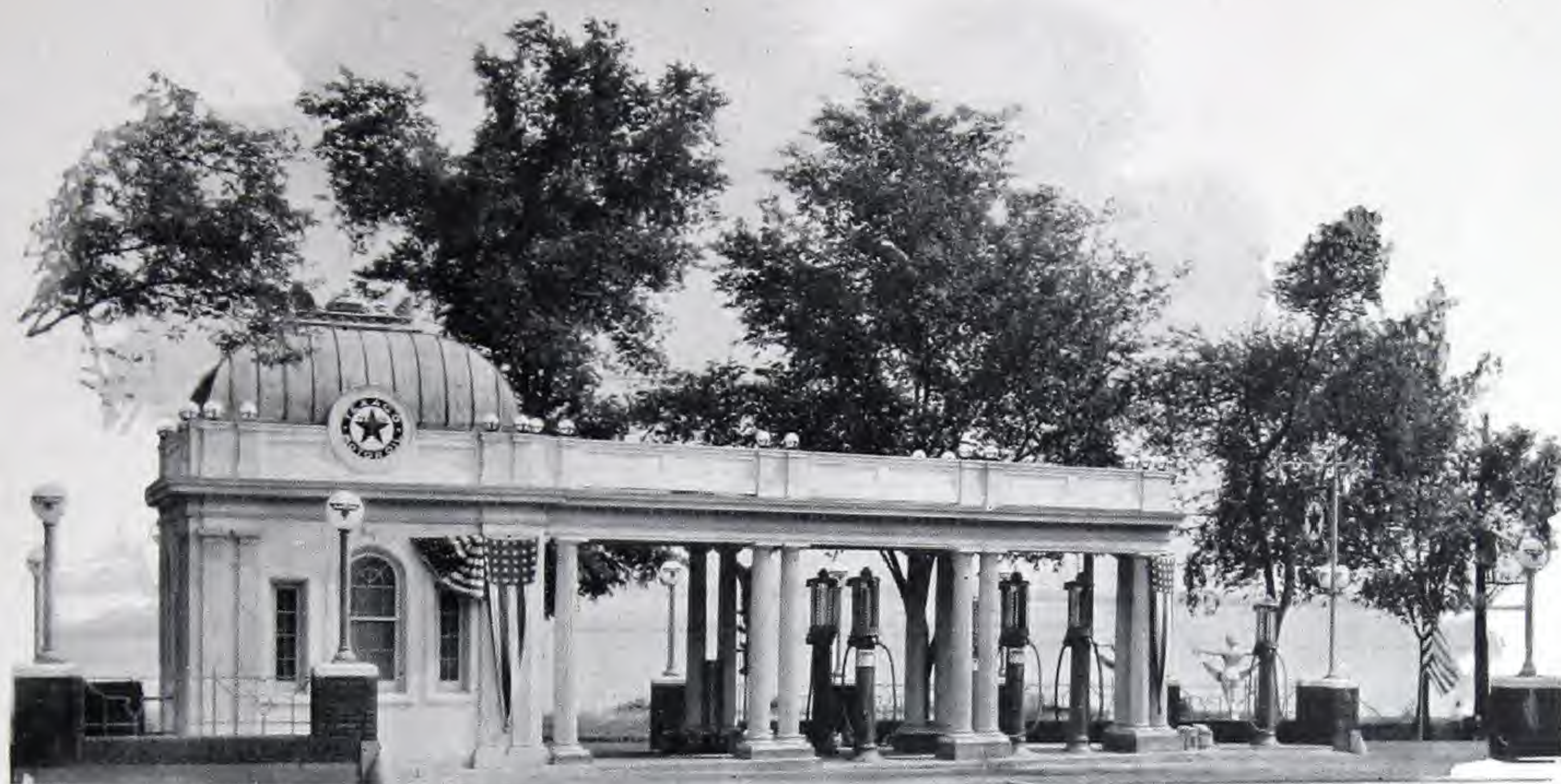


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LANNING^{AND}
OPERATING
DRIVE-IN
FILLING
STATIONS

Planning Drive-In Filling Stations

Those of you who have watched the growth of the Drive-In Filling Station during its existence must realize that it has become an all important factor in our commercial life for the retail marketing of gasoline, automobile lubricating oils and greases, and in some instances kerosene.

These stations range from the lean-to type, on an unkept piece of land, to those that are almost palatial in their architectural design and furnishings, with natural decorative effects that are worthy of our best landscape engineers that a cost running into the tens of thousands of dollars.

The first drive-in filling station was built in the middle west in the last decade. There are no accurate figures available at the present time to show the number of stations now in operation. One company alone has over 1300 in eleven states and is continually building more. Several other companies operating chains of from three to twenty stations and the tremendous number of singly owned stations, should bring the total number well over twenty thousand. Such figures give a rough idea as to the development of the industry during the past few years.

It would also appear at first thought that the field is fairly well covered, however, there are still a great many excellent opportunities in the large cities and hundreds of the smaller places which are without a filling station of any type. It must also be remembered and taken well into account that the field is continually broadening due to the ever increasing number of passenger automobiles and trucks and the corresponding increase in the sale of gasoline and lubricating oils for their operation.

In this, as well as in every other line of industry, a large number of stations have proven to be exceptionally good paying investments, while others have turned out to be flat failures. In each and every case there is a well defined reason for the success or failure of a station. A small proportion of the failures is the result of mismanagement in operation, but a careful analysis of all of the stations examined, reveals the fact that in a majority of cases they were not properly planned at the outset.

It is therefore perfectly safe to say that the success of any station, expressed in terms of dollars and cents, is dependent on its being so planned as to attract and efficiently hold and serve a maximum gallonage at a minimum cost of operation and maintenance. To this, of course, must be added the exercising of a sound business judgment in its management.

First of all decide just what you want or rather what you need. It is much easier to work this problem out in the first stages of the game than to rush in blindly and complete the job, then discover that you know what you positively don't want, and at the same time, have it on your hands.

The embryo operator (and in some cases the old timer as well) in his efforts to spread his small wealth into as much station material as possible is likely to overlook a number of important details which seem innocent in themselves but which have a peculiar way of piling up, and at the grand reckoning of cost and result, assume the proportions of a great big jolt. It is these little bumps that we propose to try and clear away from the path of those who expect to build and operate new stations.

There is one thought that must always be well kept in mind and that is the operation of a filling station makes you, in a certain degree, a public service corporation and in order to successfully serve a large and extremely critical automobile public, it will be necessary for you to make your ideas and whims, in a proportionate degree, subservient to theirs. We do not mean by this that you are to allow the automobile driving public to dictate your business policy or manage your business entirely.

In order to produce a successful station the local conditions under which it is to be operated should be carefully studied and the station building and its surrounding layout designed to meet these requirements, as no one station or single combination of ideas can be expected to serve all sorts of service and conditions.

A refinement, not possible in this investigation, is the working out of factors for readily judging how closely any particular station approaches the ideal. Much can be done however with the data available by a comparison of the future in relation to the chief factors affecting sales, which are: population and its density, per capita car ownership of the district, size and location of the lot, arrangement of drives, type of building, class and distribution of the equipment, general appearance, operating methods, present and probable future competition.

Statistics which have been compiled by some of the larger companies are not only interesting, but are well worth serious study.

Using the law of averages, based on mileage, a station located in a town of 1000 inhabitants and controlling one-half of the gasoline (on a two cent margin) and lubricating oil used by the automobiles in the town, should pay a net profit of eight per cent on the original investment of four thousand dollars and which takes into account, interest on capital investment, all operating and maintenance charges, depreciation, etc.

This is a safe minimum earning rate for towns of this class and similar deductions can readily be made for towns and cities of larger population by a careful study of the factors entering into that particular locality.

General Location

The records of one company prove quite conclusively that the station located in a fairly well settled residence district where practically every residence for a radius of ten or twelve blocks from the station, owns a car and keeps such car in his own private garage instead of a public garage, is a better paying station as far as daily average sales are concerned than the station which is located in the heart of the business district on a heavily traveled highway or boulevard where practically all of the sales are of a transient nature. In other words, the station located where community purchases are certain is practically assured of success.

There is one station located in a district similar to that described above and inhabited by the so-called middle class, owning medium or low priced cars, which were in daily use the year round for business or pleasure, and which had 532 regular customers who came on an average of three times a week, six months after the station was opened for business, and all lived within a radius of eight blocks of the station and constituted over 85% of the cars in that territory. Transients very seldom drove into this station. Of course stations of this type are subject to rush periods and provisions must be made to care for the rush in the way of extra pumps, large roomy drives and ample attendants.

At another station located on one of the prominent boulevards in Chicago, where every day in the year, between the hours of eight in the morning and ten o'clock at night, over 600 cars passed the station every hour, and it was found that only about two per cent of them drove in. It was also ascertained that only occasionally the same car came more often than once a week.

Now do not be misled and think that the station last described does not pay. They do. Hundreds of them are paying splendid returns on the investment. These cases have been cited simply for the sake of comparison and the comparisons are good averages.

When locating on a boulevard or rather heavy traffic highway, care should be taken to get on the side of the burden of traffic, particularly if the station is at all hidden from approaching cars.

Comparatively few drivers will cross the street through heavy traffic in order to get into a filling station unless it is a case of necessity.

Stations located in the center of business districts are in a class similar to those on the boulevards, unless they are located near or adjacent to a large public parking space or on a lot large enough to provide such parking space. Under these circumstances they may become something of a community purchasing point.

Stations located near amusement or public parks, ball parks, or at the outskirts of towns or resorts of any nature or on tourists' highways cannot expect to have a good daily average of sales, as a gen-



Pure Oil Co., Minneapolis, Minn.



Standard Oil Co. at Detroit, Mich, and Other Cities



Woco Pep Station, Atlanta, Georgia

eral thing, but will be subject to peak load periods and then dwindle to periods of practically nothing.

Stations located on prominent streets near the approach of large railway stations or near the approach of a well traveled bridge, usually command a good business, better than those located near large theatres or hotels.

Stations catering to trucks should be easy of access immediately before they pick up their loads or immediately after they have discharged them. They will seldom pay if located along the route of the loaded trucks.

Selection of the Lot

After having decided that any particular locality will produce enough business to make a station a paying proposition, the next step is the choice of a lot.

Corner lots are always more desirable than inside lots. They are almost absolutely essential on boulevards and other places of congested traffic in order for cars to get in and out without danger of damage or an accident. Another strong point in their favor is that they are very seldom shut in from view and can be seen by approaching cars for several hundred feet.

A driver will very seldom turn in unless he sees the station some distance before he reaches it, unless his supply of gasoline is almost depleted.

Corner lots are also susceptible to a better driveway arrangement for the rapid handling of business during the rush hour periods, if they are of reasonably good size.

Inside lots can be used to good advantage in residence and business districts if of sufficient size so as to allow a proper driveway arrangement.

Keep away as much as possible from narrow or unpaved streets or streets on which street cars or other tracks are located.

One city of about 300,000 recently denied permits to build filling stations, giving the reason that the locations were on streets through which trolley lines operated and were so narrow as to greatly increase the liability of accidents.

It can be readily seen that drivers are going to hesitate before patronizing stations located in this manner.

The Board of Safety of one city has held that there should be at least eighteen feet between the nearest car rail and curb to allow automobiles to turn in and out of private property without danger.

Avoid lots that are more than four feet above the level of the street or that are located on or at the foot of a steep grade.

Triangular lots when not too narrow usually make very good station sites.

In casting about for locations, don't confine yourself to vacant property. It often occurs that existing structures can be razed at a small expense and a very desirable location thus secured.

Size of the Lot

The size of the lot is always a question. It depends largely on what can be secured, the price asked, and the number of cars that must be served. It is strongly urged to refrain from entering a locality the property of which is not large enough to properly build on and not adequate for successful operation.

Perhaps the simplest method would be to give the minimum size of a few lots which have been found to work out to good advantage.

Inside lots facing on one street only should have a frontage of at least 100 feet and a depth of 50 feet.

Inside lots, with a frontage on two streets (that is running clear through the block) should have a minimum width of 50 feet. Stations located on this class of a lot very seldom become large steady gallonage stations unless situated so that they are not obstructed from view by buildings on either side or can be made community purchase points.

Corner lots for small gallonage stations (500 to 600 gallons per day) should have a minimum of 50 feet frontage on each street, providing the streets are fairly wide and without street car tracks. Where stations are doing a larger business, these frontages should range from 80 to 100 feet, especially where traffic is heavy or inclined to become congested.

The above dimensions are for stations handling gasoline and lubricating oil only. If tires or other accessories are to be handled, at least 20 feet should be added to the width in every case.

When triangular lots are used they should be at least 100 feet in depth by 50 feet across the back.

Remember these are all minimum dimensions and can usually be greatly increased to good advantage.

One of the best arranged and largest gallonage stations, which has come under our observation, is located close to the center of a city of the half million class and occupies an entire block approximately 250 feet square, with driveway entrances from all streets.

Although this station is of an unusually expensive type it is paying over 50% on the investment.

Leases

Some oil companies will build stations only where they own the property. It certainly does not pay to build on a lot where the lease is less than five years, although some of the larger companies attempt it on a three-year lease. You can salvage practically nothing from the cost of the building (except the portable type), piping, driveways, landscape improvements, etc., and you cannot afford to build in a manner permanent enough to attract and serve a maximum gallonage and then send practically all of it to the scrap heap at the expiration of two or three years.

We believe that in a locality where the prospects look reasonably good, it is the best policy to secure a five or ten-year lease, with a privilege of renewal and an option to buy.

There are two other clauses that should be incorporated in the lease. The first is that the building and all other improvements are the property of the lessee and may be removed at the expiration of the lease.

The second, that in the event of any existing or future city ordinances, county or state legislation or court decisions which make the property inoperative for filling station use; then the lease shall terminate and become null and void at the option of and without liability for damages on the part of the lessee.

Position of Building on Lot

The placing of the building on the lot is something for which it is impossible to lay down any definite rules.

Surrounding conditions and the proposed method of operation must be carefully studied. The position of the building is dependent on the size and shape of the lot, obstructions to driveway entrances, the width of the streets, grade of streets and lot, whether there are street car tracks or not, and if on a corner, which street carries the burden of traffic.

Accompanying this article are several typical ground layouts which may serve in a general way to help you to determine what is best in your own particular case.

Buildings placed in or near the center of the lot and without covered drive-ways, so that cars can be served on all sides are susceptible to handling more cars and handling them more rapidly and more efficiently than when the building is placed close to a lot line.

The Building—General Type

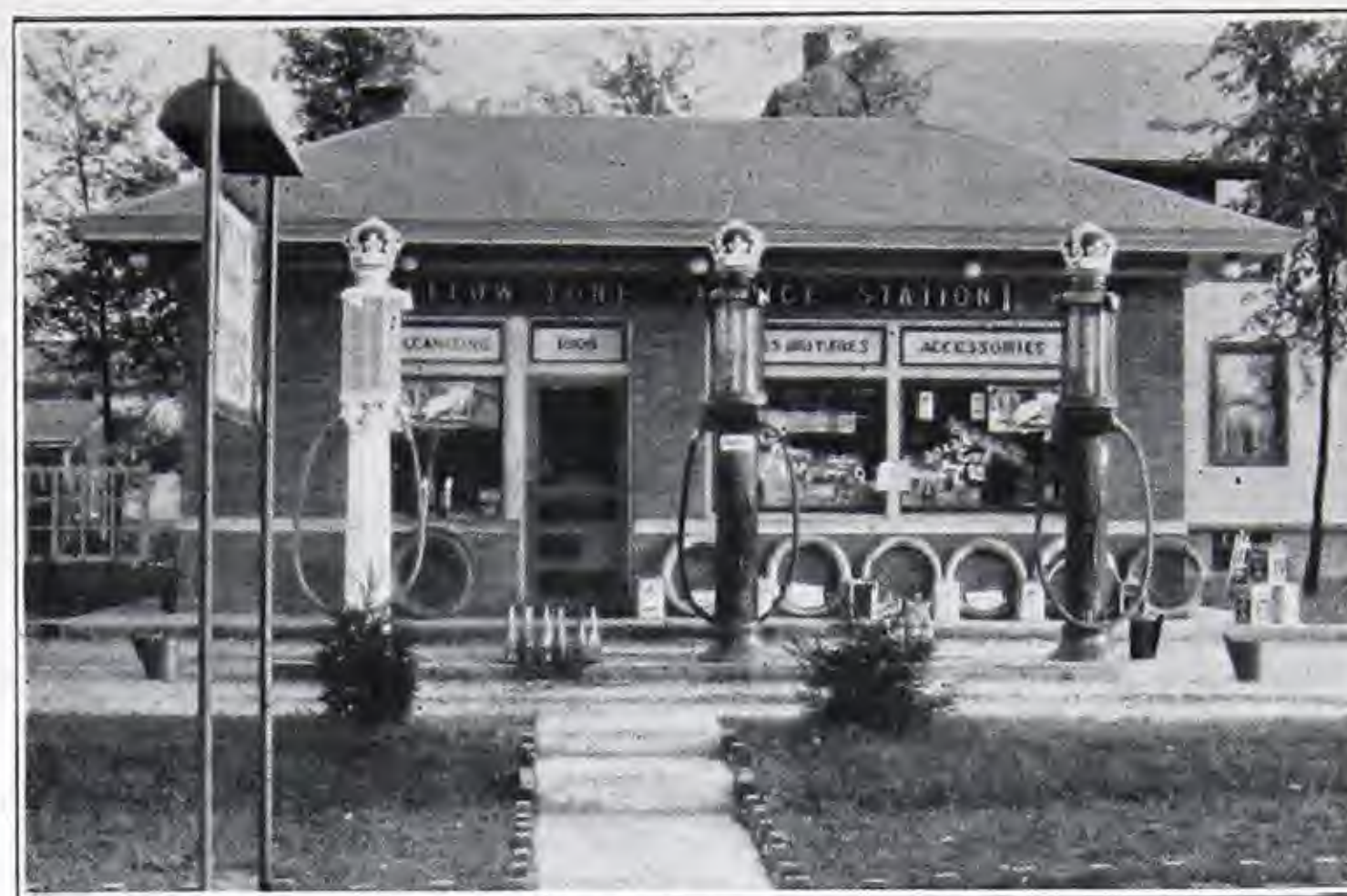
We must now consider the question as to what type of building we shall use.

If a number of stations are to be operated either in the same city or in a chain of cities, by all means adopt a distinctive type of architecture, color scheme, etc., at the start and then stick to it. The object is to make your stations recognized at first sight even though seen from a distance. This argument is strongly substantiated by the fact that such companies as Woolworth and Kresge Stores, the Liggett Drug Stores, the United Cigar Stores and several others have their distinctive features. This is a very cheap and effective method of advertising.

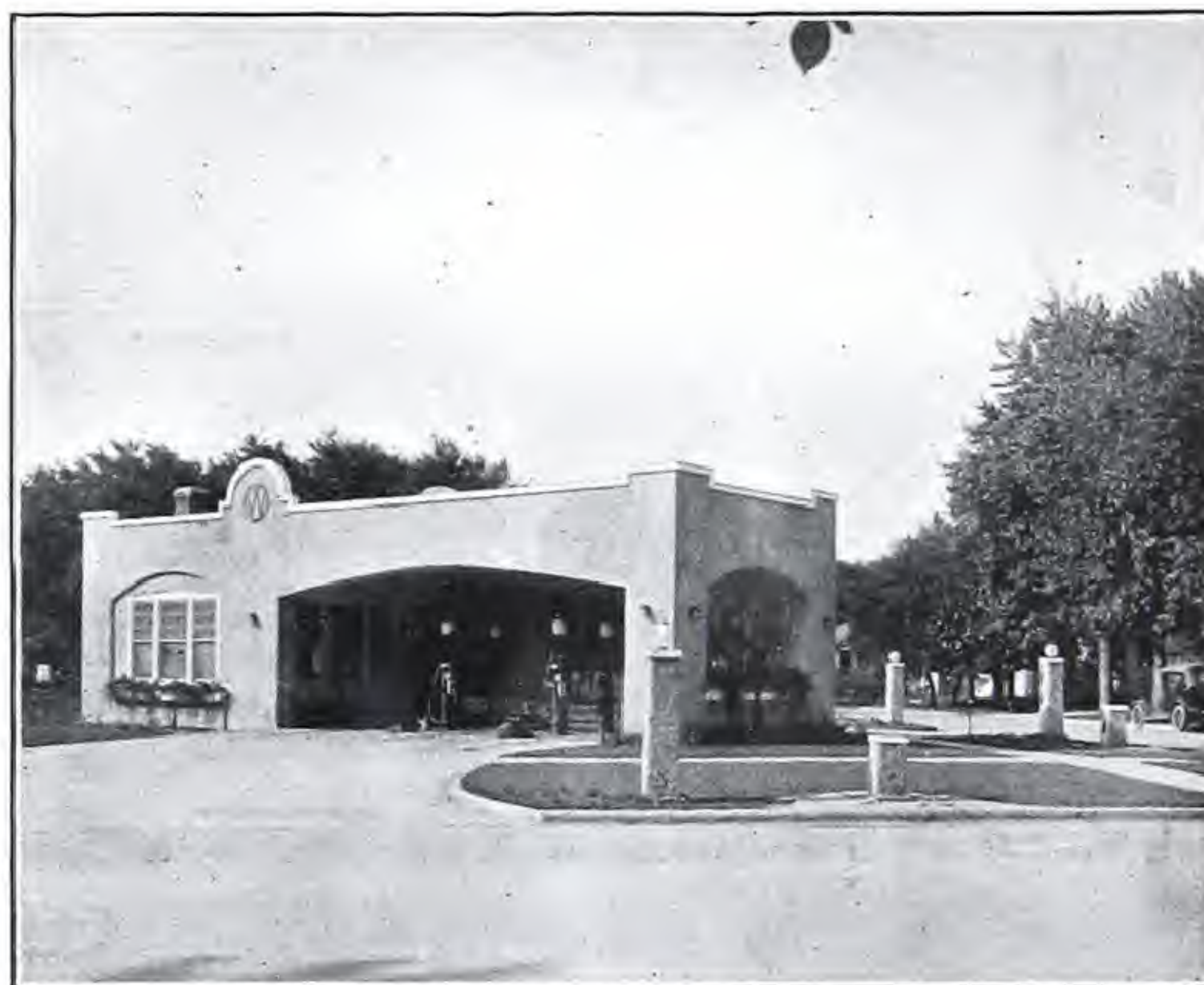
For example, practically all of the stations of one company carry a tower, another builds almost exclusively on triangular lots, using a building in the shape of a triangle with the point cut off.

Decide in a general way the kind and size of lot you will endeavor to secure in all or as nearly all cases as is possible; investigate as to what is to be handled in the way of stock; and determine your general operating scheme. Then you can have the building designed to meet these conditions.

Plan the building solid, substantial and attractive, but not of the "ginger bread" type. Bear in mind that it is a place of business. It should be designed in such a manner that it can be placed in



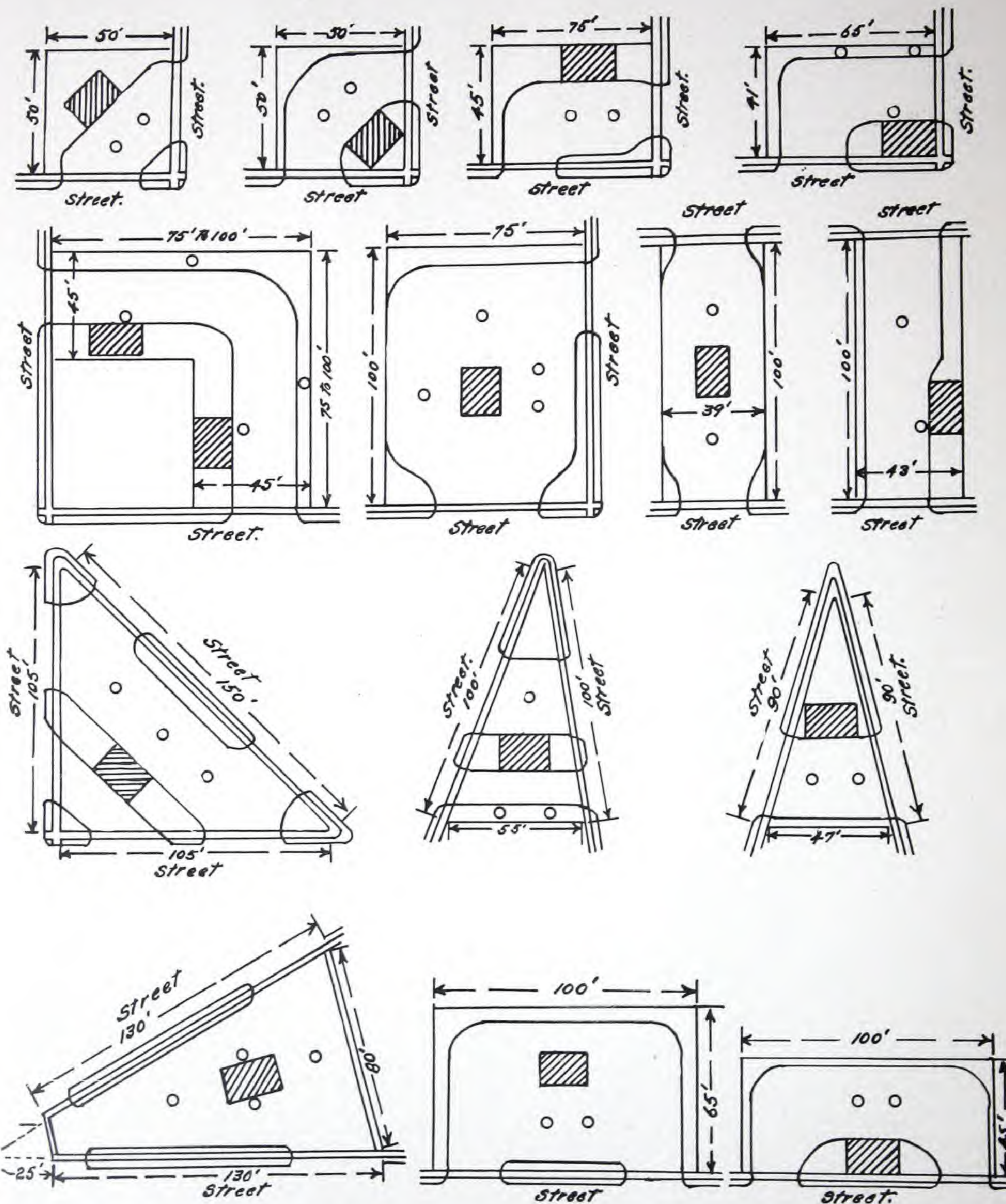
Yellowstone Service Station
Fort Wayne, Indiana



W. W. Wasson Filling Station
Norfolk, Neb.



Central Oil Company
Detroit, Michigan



Made from a study of approximately 2,000 operating stations.

Typical ground layouts showing minimum size of lots to which they are applicable. Single driveways are shown as 13 ft. wide and double drives are 25 ft. wide. Pump islands are 3 ft. wide and buildings 13 ft. by 19 ft. without cover over driveways. Buildings are shown thus and pumps by a circle O.

the better residence districts without causing ill feeling to your neighbors.

We would recommend that the building should be wholly fireproof, or at least semi-fireproof, whenever possible.

Basements

The question of a basement is one which has received a great deal of discussion and attention, particularly at the hands of two or three of the larger companies.

The advisability of a basement depends somewhat on local conditions, but more largely on the proposed method of operation.

It would seem that the first and likewise the most important factor entering into the question as to whether a basement was necessary or not is whether the property is large enough to accommodate a building with all the necessary toilets, etc., on one floor, and still give ample room for the necessary driveways. If not, then the floor space must be cut down by putting in the basement.

The gentlemen's toilet, air compressor, heating plant and the fuel can be placed in a basement to good advantage; when tires, accessories or lubricating oil in cans are handled at the station, a small reserve stock can be stored in the basement.

A basement properly built will add 25% to 30% to the cost of a building as compared with one of the same design without a basement.

Rest Rooms and Toilets

Nearly all stations built within the last year have at least one toilet. One of the large cities has passed an ordinance making at least one toilet with a floor space of 30 square feet obligatory. The better class of stations have two toilets.

Valuable sites on park property have been obtained by one company for filling station use by constructing a complete comfort station, having entered into an agreement with the city to maintain it in a sanitary condition for a specified term of years and to furnish all supplies, towels, soap, etc.

A number of stations are also equipped with a ladies' rest room in addition to the toilet. In one station recently visited, the rest room was large enough to hold three good sized chairs and a writing table with chair. The writing table was equipped with stationery and the windows hung with silk curtains.

Toilets should be equipped with a self-draining, non-freezing shut-off valve and they should be religiously shut off with the closing of the station, unless the temperature of the station is kept above the freezing point all night.

Roofs and Floors

Do not build wooden floors unless the station is purely a temporary one and subject to being dismantled in a few months. They are hard to keep clean and soon become oil soaked and dangerous, even with the greatest of care.



**J. H. Martindale Filling Station
of Dallas, Texas**



**National Refining Co. of Cleveland, Ohio. Type of
Station Used at Peoria, Ill., and Other Cities**



The Texas Co. of Houston, Texas

Concrete floors are naturally cold and therefore a little harder to heat in the latitude of hard winters. However, this can be overcome by the proper installation of the right heating plant.

If a basement is installed, the floor should be thoroughly reinforced. Concrete floors very seldom give any trouble from cold when used in connection with a basement.

Red Spanish tile makes a good, serviceable and attractive floor.

The type of roof employed will materially affect the insurance rates.

Do not use wood shingles on account of the danger or the ordinary tin roof on account of the looks.

Earthen tile is the best for sloping roofs, but this means a heavy super-frame and an unnecessary expenditure of money. Metal tile or asbestos shingles are recommended for sloping roofs and the prepared gravel or slag roofing for the flat roofs.

Inside and Outside Finish

A great many stations, particularly those owned by individuals, are never finished on the inside. This is a grave mistake. Remember a station which is attractive in every detail will draw trade, just as an attractive theatre, restaurant or store does.

Plain sheet metal, beaver board and matched siding are used extensively and are inexpensive. Plaster on metal lath makes a durable and fairly reasonable method of finishing and can be made very attractive when used in connection with an ornamental steel ceiling.

Tile or glazed brick used with an ornamental steel ceiling is probably the most permanent and has the advantage of being easily cleaned and maintained, although more expensive.

Do not build stations entirely of frame. If first cost must be kept to a minimum use timber frame with cement, or sheet metal finish, or a veneer of common brick or concrete block.

Pressed brick, wire cut brick, concrete or a combination of concrete and brick all make very handsome stations and reasonable in price.

White glass brick, glazed brick and tile are considerably more expensive, but are of long life and low maintenance.

The ceiling of covered driveways should be carefully worked out. They should be of such construction as to be easily kept clean and reflect all possible light. Ornamental steel panels or cement finish will give the best results.

Lighting of Building and Grounds

Many filling stations have the appearance that the owners are afraid to spend money for lighting purposes.

Transient trade will not stop unless they see the station a considerable distance before they get to it, and unless the building and its grounds are well lighted they will not be able to see it at night.

Use high candle power lamps and plenty of them. Have a lighting expert specify your reflectors.

A building 14 feet square should have at least two 200-Watt Lamps inside, not including the toilets and at least four 100-Watt Lamps on the eaves outside.

A safe rule to apply for inside lighting is 200 Watts for each 100 square feet of open floor space.

When driveways are covered they should be just as well lighted as the inside of the station, and even better. They must be well enough lighted for men to see under hoods, and pour lubricating oil without spilling it. They must also be light enough to look into the openings of the gas tanks of automobiles.

All wiring for the building should be in metal conduit with approved conduit openings. Switch and fuse boxes should be of the closed type.

Ornamental light posts, placed on both sides of the driveway approaches and at other suitable places, not only beautify the grounds, but are also good advertising mediums. These should be equipped with 100-Watt bulbs and 14" or 16" globes.

All wiring for outside lights should be underground and should be lead covered cable laid inside of metal conduit.

Driveways should be so thoroughly lighted that there can absolutely be no danger of a driver getting off the driveways or having an accident of any kind.

Use 100-Watt lamps for pumps, etc. Lamps of 60 Watt have no place in a filling station, except in toilets, air compressor rooms and the like, unless used in clusters, which requires more expensive fixtures.

Heating and Ventilation

When a basement is used, either a hot water system or a small hot air furnace can be used with good results. If there is no basement, a hot water system or hot blast stove (known as the depot type) is the best.

If the hot water system is used without a basement, a section of the floor upon which the plant is installed must be dropped about eighteen inches to care for the returns.

Several companies have tried heating with gas, but the results were very poor. When natural gas is used there is always the liability of a drop in pressure and a reduction of pressure usually accompanies a drop in temperature at a time when heat is most needed.

The troubles experienced from low pressure is not experienced when artificial gas is used, but it will be found that it is a very expensive method of heating. We have known a great many small stations through Michigan, New York and the New England States to have bills of \$30.00 and over a month, when using artificial gas.

A concrete floor is extremely hard to heat, particularly in a filling station where the doors are being constantly opened and closed. Unless the building is perfectly heated it is almost impossible for attendants to remain free from colds and rheumatism during the winter months.

There is no gas heater built which will properly throw the heat down on the floor. It is also a fact that the air will become dangerously foul and cause a great deal of dampness and sweating inside of the building, unless the mixing valves are adjusted as to secure perfect combustion and the heater properly vented through the roof.

Some stations are being heated with kerosene in which a special burner is employed. The kerosene being supplied in the form of a gas through the application of air pressure applied to the storage tank. This method of heating has not, thus far, proved to be much of a success.

The storage of coal has appeared to be a problem to many operators. When a basement is used the difficulty is quickly solved.

A half ton of hard coal should be enough to heat a building not larger than 15x20 feet for a season in almost any section of the United States in which filling stations are now in use. A box built of two inch plank, and 7 feet long by 2 feet wide and 3 feet high will easily house this amount of coal.

For smaller heating plants, iron shipping barrels with one end cut out, make both good coal and ash containers.

Fuel oil burners are now being successfully used for heating filling stations.

It is just as hard to properly ventilate a filling station as it is to properly heat one.

All doors should be equipped with a movable transom. Windows should also be installed so that they can be raised and lowered at both top and bottom. They should have an inside swinging section if the sashes are of the fixed steel type.

Toilets should be ventilated to the roof and chimneys should be ample in size and carefully constructed.

Portable Buildings

Portable buildings can be secured at a fairly reasonable figure from a number of the Metal Fabricating Companies located in the various parts of the country. These are shipped "Knocked Down" and can be assembled without much cost. They can be obtained both with and without covered driveways.

These buildings are supposed to be fireproof but in some cases will not conform to the building codes of some of the larger cities.

They are very seldom furnished with a toilet, chimney or room for air compressor. The windows are usually stationary and the doors without transoms.

They are very hard to finish inside in a satisfactory manner, and are inclined to be cold in winter and hot in summer. They are very difficult to fasten to a foundation so that they will be immovable from the action of wind or from being run into by a car; also rain, snow and wind will get inside. Roofs and driveway covers are also apt to sag from snow loads.

They are good purely as a temporary building which may have to be moved, and for leases of three years or under, five-year lease with a 30-day



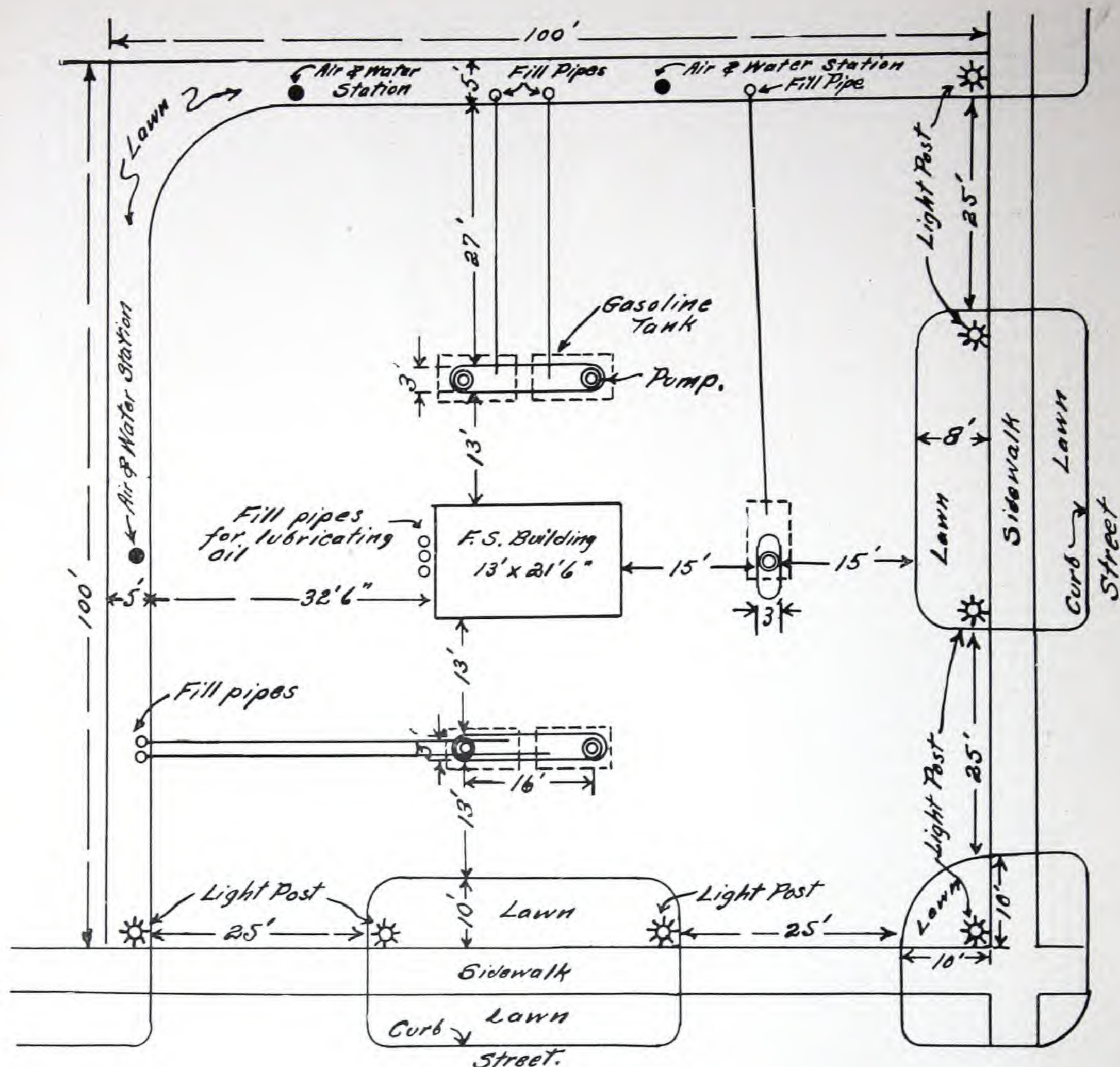
Waite Phillips Oil Co.
Kansas City, Mo.



Consumers Service Station, Inc., of Rock Island, Ill.
Type of Station Used at Monmouth, Ill.
and Other Cities



College Hill Service Station
Cincinnati, Ohio



Typical ground layout for a large lot.

vacation clause and property occupied on a month-to-month basis.

Covering of Driveways

Probably nothing has provoked more discussion among filling station men, than the question as to whether or not driveways should be covered. Practically every one, when first approached on this question, replies in the affirmative.

Let us carefully analyze the problem from all angles.

The first station ever constructed had the driveways covered. Some of the companies who have been building a large number of stations every year, for the past three or four years, have maintained research departments, in order to carefully study these questions, now are building practically all of their stations without covered driveways.

If two driveways on the same side of the building are to be covered it is necessary to add approximately 40% to the cost; to cover a single driveway add approximately 25%. If more than two driveways are covered, the cost is increased still more.

There is very little argument concerning the statement that more cars can be efficiently served in the same length of time on the same sized property where the driveways are not covered than where they are. The supports of the cover naturally limit or cut down the driving area, thereby tending towards congestion, and congestion always means poor and slow service.

The principal reason for covering the driveways is to protect the patron who wishes to get out of his car during the filling operation. Statistics kept at one station having covered driveways, doing a large gallonage, revealed the fact that less than 8% of the customers actually left their cars.

Unless the covers are of unusual dimensions they create a considerable amount of trouble at stations which have a great number of trucks as customers.

In view of the foregoing, even taking into account the fact that the covered driveway is most useful in stormy weather, at which time this class of business is at its lowest, it would seem that it was a waste, not only in the cost of construction and maintenance, but in efficient operation as well.

Stations can be made just as pleasing and artistic without this additional expenditure. However, there are probably cases where a covered driveway is very desirable but the writer believes they are the exception rather than the rule.

If it is decided to cover the drives for any special reasons, the following rule should be borne carefully in mind:

The clearance, from the drive to the lowest part of the cover under which a car has to pass, should not be less than ten and a half feet and should be twelve feet if there is any probability of a truck using the drive.

If two drives are located under one cover, span the entire distance! Do not have center supports, or columns. The roof span should be carefully calculated by a competent engineer or architect so as to be sure that it is constructed in such a manner that it will not sag from its own weight or from an accumulation of snow and ice.

Each drive should not be less than thirteen feet in the clear and fourteen would be better, when two drives are under the same cover, but separated by a pump island or ramp. When they are not separated by a pump island, but have the pumps located next to the building and on the extreme outside, twenty-five feet should be allowed. One company has recently constructed a very expensive station on this plan and allowed a twenty-seven-foot clearance.

Location and Construction of Driveways

The location of a driveway is naturally governed by the location of the building, and must conform to local conditions. Typical driveway layout are shown in the accompanying sketches.

Driveways, located under cover, should not be less than thirteen feet in width and fourteen feet would be better. Those in the open can be twelve feet wide for one way driving if absolutely necessary but should be at least twenty-five feet for two-way driving.

The approach at the curb is a very important feature and should not, under any circumstances, be less than twenty-five feet for approaches which are used only for entrance or exit. If used for both entrance and exit they should be thirty-five feet wide. Two companies are now widening their approaches to fifty feet wherever possible.

Do not have any abrupt changes of grade in the approach. We know of one station that lost about 50% of its business on account of a two-inch drop at the curb, which was the cause of several broken springs, dished wheels and bent axles.



The Connecticut Oil Co.
Bridgeport, Conn.



Muscogee Oil Company
Columbus, Georgia



The Fergus Oil Company
Minneapolis, Minn.



Typical Station with Two Covered Driveways

Avoid sharp turns particularly when close to a covered driveway.

Many of the better stations now have a concrete curb about four inches high and two and one-half inches thick on both sides of the driveways.

Cinder and ordinary gravel driveways, although not expensive to build, are extremely expensive to maintain. They are always dusty and have a mussed up appearance. The drive soon becomes full of holes and repairs are constantly necessary in view of the fact that traffic is over the same spot continually.

The only two classes of pavement which are really suited for filling station use are a true water-bound macadam (specifications will be furnished upon request), and concrete with a smooth cement finish.

The cost of the macadam pavement is slightly less per square yard than the concrete, but at the end of three to five years, the first cost plus the maintenance will be slightly greater than the first cost of the concrete pavement plus its maintenance.

Stations at which trucks are served should not consider anything but the best concrete pavement.

Give concrete pavements a good foundation and put in expansion points every ten or twelve feet.

One company is re-enforcing their pavements by placing chicken wire between the first layer of concrete and the cement finish. They are also using a hardening material in the finished coat. Another company is using lampblack in the finishing coat, in order to keep their pavements of a uniform color which will not show oil stains.

Under no circumstances allow a tree or pole to be in the center of the driveway approaches. Some very serious accidents have occurred in this manner.

Pumps and Tanks

The entire station is being designed and built primarily for the sale of gasoline and lubricating oils, consequently we can truthfully say that the type and location of equipment to be used for the storage and dispensing of these commodities can be considered as the most important and vital problem that we have to consider.

Let us first consider the storage tanks. All tanks should be built of open hearth steel plate. When galvanized they should be of not less than fourteen gauge. Tanks of this type should not be used for capacities over 1100 gallons. When constructed of heavy metal they should not be less than 3/16" plate.

All tanks should bear the label of the National Board of Fire Underwriters' Laboratories.

It is better to use tanks for gasoline storage of less than 1000 gallon capacity and stations having large gallonage sales or located at extreme distance from the bulk storage should use 2000-gallon tanks or larger. Nothing can be more detrimental to a station than to have to say to customers, "No Gas." Large storage also greatly helps to reduce delivery cost.

It will be found more satisfactory to use a separate tank for each pump, as it will prevent the putting out of service of more than one piece of pumping equipment in the event of a tank becoming foul or being temporarily out of use for any reason. Before installing have the tank carefully strapped (measured) with an accurate steel tape and carefully preserve the measurements for use in gauging the tank.

Detailed instructions for strapping will be taken up later. Two tanks of the same rated capacity, no matter by whom built will not measure up the same.

See that the tank is installed perfectly level. If placed in loose sand or ground which is subject to being filled with water, the tank should be strapped to an oak or concrete foundation.

If the tank is not galvanized it should be given one heavy coat prepared from the following formula, before being installed: Mix cold by carefully stirring four (4) parts of Portland cement in three parts of kerosene oil. This mixture is then stirred into sixteen (16) parts of coal tar. Paint should be freshly mixed and kept well stirred. This will add greatly to the life of the tank.

In only comparatively few cases will the fill box be located directly over the tank, therefore it is advisable to have a two-inch flange placed at the center of the top of the tank and piped to the surface of the ground to be used for gauging the quantity of gasoline on hand. It is also good practice to place a fill box and cover at the ground or pavement surface and have the piping so arranged that the suction line and foot valve can be removed without digging.

Be careful to see that the tank is properly vented.

Tank trucks are being built with larger piping in order to insure more rapid unloading. One company has reduced its unloading time approximately 60% by increasing the piping on its trucks from one and a half inches to three inches. You can very materially assist your jobber, and if you are operating your own trucks you can very greatly cut your delivery costs, at the same time relieve congestion around your station, by having your tanks all equipped with large fill pipes.

The company mentioned above has gone to the extent of taking up the tanks of its own filling station and also the tanks of a great many of its customers and fitting them with the larger fill pipes.

Tanks should be placed reasonably close to the pumps which they serve—usually not over one hundred feet away. One company places them immediately under the concrete island on which the pump stands, while a second places them under the driveway as close to the pump as possible.

The usual method is to place them near the driveway under a grass plat. All of the piping and the fittings for the gasoline system must be galvanized and all joints must be laid up with litharge and glycerine.

It is best to have the tank, piping and pumps installed by some one who thoroughly understands the work and the entire system should be inspected by the proper city officials before being covered up and put into use.

Fill boxes should be so located that trucks standing at them to unload will not obstruct either driveways or pumps.

It is a good idea to carry the fill boxes to the curb line, if the street is one that does not have too heavy traffic and the city ordinances will permit it.

Pumps used for the sale of gasoline should bear the label of the National Board of Fire Underwriters' Laboratories. A great many municipalities demand this in their ordinances, and it certainly



John Hancock Oil Company
St. Paul, Minn.



Indian Refining Co.
Fort Wayne, Indiana



Typical Station with Driveways Not Covered

is an asset when taking out fire or public liability insurance.

Pumps should be what is known as the 5-gallon type rather than those discharging a small quantity and should be equipped with a filter. Install only such pumps as are known to be accurate, safe and fast. Have them frequently tested for accuracy and sealed by the local sealer of weights and measures.

Do not make the mistake that operators frequently make by saying that your pumps are too slow to serve your trade. It is a fact that most pumps can deliver gasoline as fast or faster than the average car can take it. If you are unable to take care of your trade, investigate very carefully and we believe that you will find that it is more pumps that are needed instead of faster ones.



The Connecticut Oil Co., Stamford, Conn.

Do not use pumps known as inside pumps (designed for use inside of buildings) for work outside. They are not provided with a housing to protect them from the dust and dirt and in cold weather are apt to freeze.

When filling stations were in their infancy, the pumps were placed inside the buildings. This practice has been almost entirely discontinued. A great many of the pumps originally placed inside have been removed.

When the pumps are placed inside they are the cause of attendants taking a great many unnecessary steps, which is a loss of time and money to both the owner and the customer. When they are located inside of a building heated by an open flame of any kind, they always create a fire hazard. The customer cannot easily see the counters on the pumps inside the building, and therefore becomes dissatisfied.

In order to give the best results, pumps should be placed on concrete islands in the center of driveways in such a manner that cars can drive on either side of them.

The number of pumps to be used will depend on the probable gallonage, the number of grades of gasoline to be handled and the rapidity with which the cars must be handled during rush hour periods.

Stations are now in operation which are equipped with as many as thirty-four gasoline pumps.

The grounds and driveways should be so planned that extra pumps can be added in the future. The piping, tank and concrete islands for extra pumps should be installed at the time the station is built.

The islands, when used for a single pump, should be about seven inches high, three feet wide and six feet long with a foundation of about two feet, depending on the soil.

When two pumps are placed on the same island, they should be at least eleven feet apart, but some engineers are placing them seventeen feet apart.

Do not place pumps in such a position that when a car is being filled, at either dash or the rear, that any part of the car will overhang any part of the sidewalk.

Remember that your pumps are machines pure and simple. They are like every other machine and must be cleaned and oiled at stated intervals in order to give you and your customers the best service.

Storage of Lubricating Oils and Kerosene

There are several methods of storing and dispensing kerosene and lubricating oils. Few stations will find it profitable to handle kerosene. When handled, it should be stored in an underground tank of about 500 gallons and dispensed through a kerosene measuring pump placed inside of the building.

Lubricating oils are usually carried in three grades—light, medium and heavy.

Lubricating oils were stored originally in light metal round tanks holding approximately one and one-half barrels and drawn out by means of a tin non-measuring plunger pump. This method proved to be very inaccurate, wasteful and dirty, and was

superseded by heavier, square or round tanks of approximately one barrel capacity and equipped with self-measuring quart pumps.

A variation of this method is to use underground storage and a one-quart pump, completely housed for outside use and installed on a concrete island the same as a gasoline pump.

The tops of the tank should be three feet below the surface of the ground in all cases where tanks are placed underground for the storage of lubricating oil, so that the flow of the oil will not be affected by the frost.

Another method is used by some of the companies having bulk storage and warehouse facilities for can and bottle filling. Pint, quart and two-quart bottles or cans are filled at the warehouse and delivered to the filling station in crates or trays which are similar to milk trays. The attendant fills his trays direct from these containers. He is charged with so many bottles of a certain size and a specified grade of oil, and must either return the filled bottles or an equivalent in money.

This is an expensive method inasmuch as the oil has to be handled over several times and warrants slow service and the bottles or cans should also be cleaned every time they are used.

Sales of Accessories

If tires or accessories or both are to be handled it should be fully decided what class of stock and the quantity to be carried while the station is being planned.

Several stations in various parts of the country which started in with a complete line of accessories have discontinued their sale, the reason being that it actually reduces the gross sale of gasoline and lubricating oil.

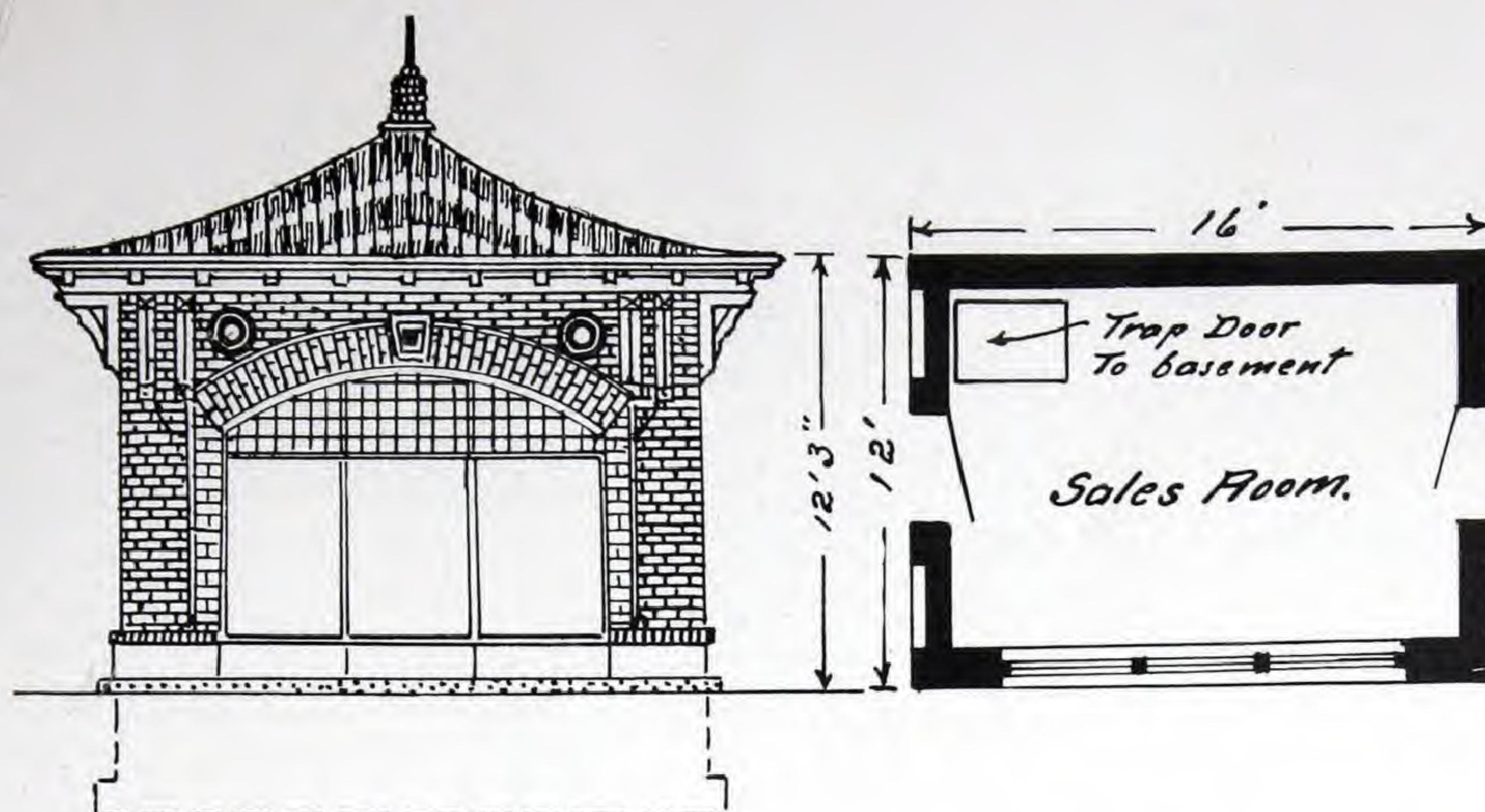
A man coming in for gas will get out and leave his car blocking a pump for several minutes while purchasing or looking over accessories. If there is only one attendant, his time is also required to show the accessories, and you will find that a large part of the time his hands are not in condition to go to a show case and handle that class of merchandise.

It is a peculiar thing, but automobile drivers will not wait any great length of time at a filling station. They usually imagine that they are in a great hurry and as the stations are generally so plentiful they will drive on to the next one rather than wait a few minutes.

Unquestionably fairly large profits can be made from a stock of accessories of the right class, and in some localities it would be impossible for a filling station to make money on the sale of gasoline and lubricating oil alone.

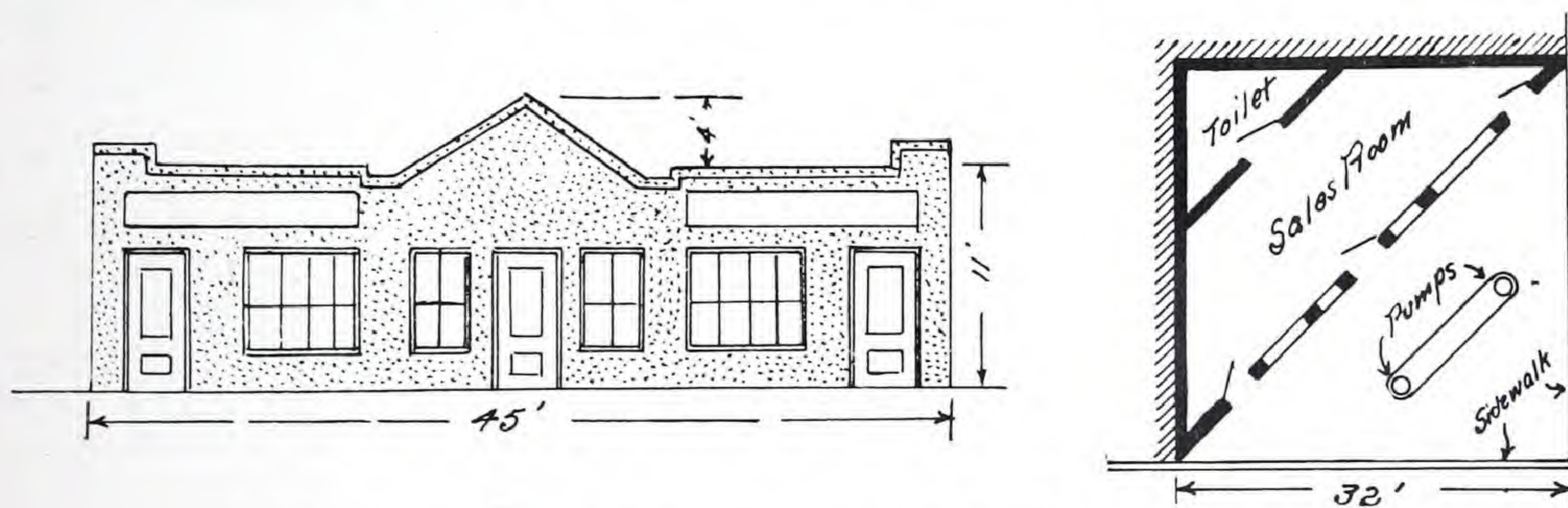
If possible an extra driveway should be constructed for cars desiring accessories so that pumps will not be blocked by patrons leaving their cars to patronize this department.

Keep accessories in glass wall or window and cases. Do not have more than one show case, and that one not more than four or five feet in length. The opportunity for theft is far greater in a filling station than in the ordinary store.



Building of brick with wood frame for roof covered with copper. Wood cornice. Red tile floor. Inside finish of plaster. Basement with toilet, heating plant and compressor. Entrance by winding steel stairway.

Printed by permission of Automobile Journal Publishing Company of Pawtucket, R. I.



Building triangular in shape. Hollow tile with stucco finish. Plaster inside. Concrete floor. Built up gravel roof. No cover over driveway.

When accessories are handled windows should come within three and a half feet of the ground in order to assure proper display.

Air Compressors and Location of Air Lines

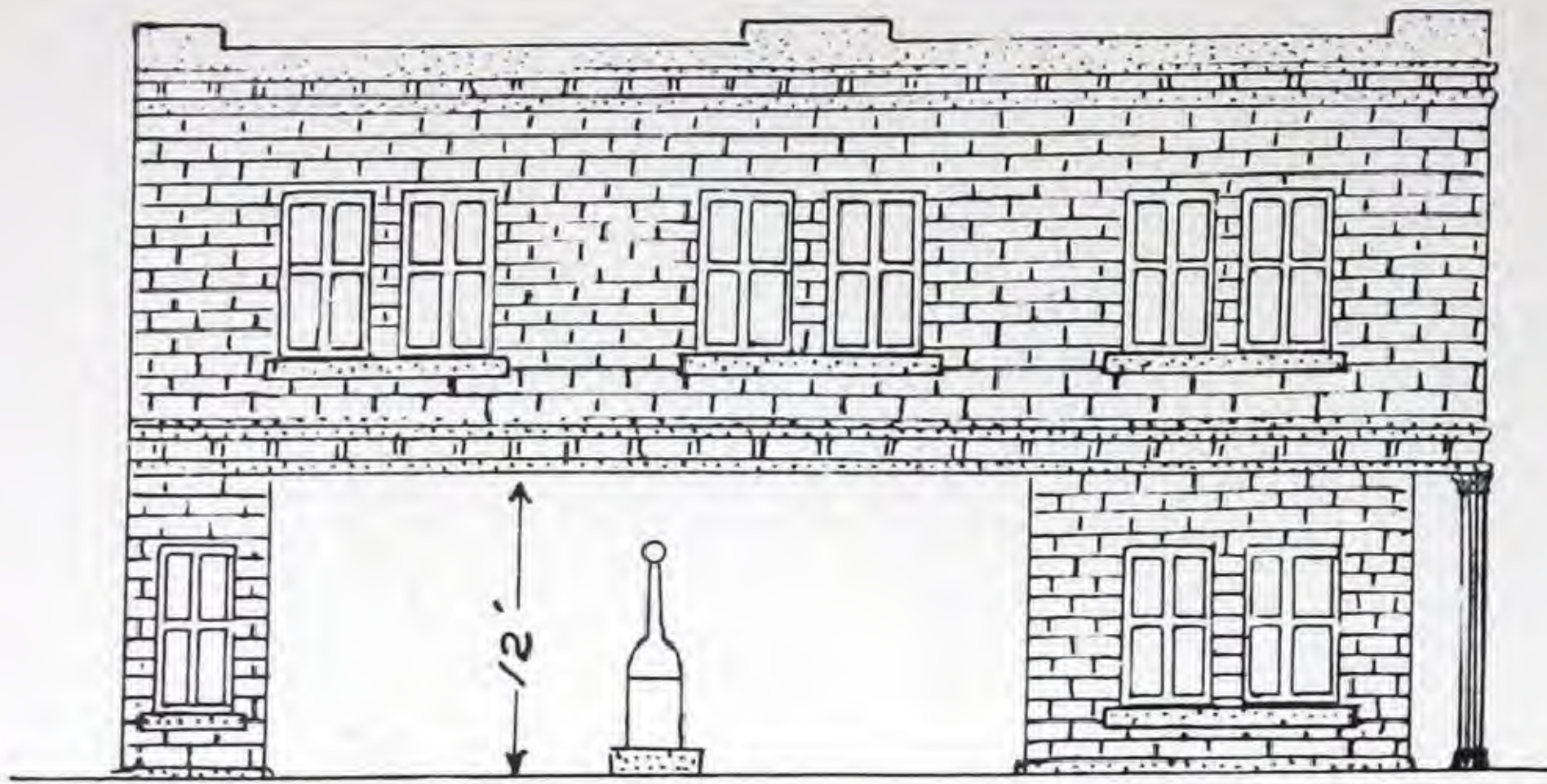
The precedent has already been established as to whether or not free air shall be furnished at filling stations. The automobile driver looks for it and expects it just about as much as he does gasoline and lubricating oil. It is, of course, a method of indirect advertising.

The location of the air lines should be very carefully considered. The practice of placing them at the curb is, we believe, a wrong one. The purpose of the drive-in filling station is to bring the automobile driver onto the property. When the free air is intended to act as a drawing card, an air delivery station located at the curb has just the opposite effect. Cars that are being served or

waiting to be served with air are liable to block or interfere with the easy entrance to driveway approaches, except in cases of very large lots. Air stations when so placed are also usually hard to reach when leaving the property.

If a person carefully watches an air station located in this position, it will be found that in the majority of cases, where a man stops for air at the curb before being served with gasoline, he will go on to the next station to spend his money. He will do this rather than make the swing out into the street that is usually necessary in order to get into the driveway.

When this equipment is located inside the property it should be at least twenty-five feet from any pump or driveway entrance and should be so placed that the cars being served with air will not block or congest the driveway approaches or the pumps.



To cover small triangular lot. Filling station on first floor with offices on second floor.

Building of solid brick trimmed with terra cotta and concrete. Second floor reinforced with I beams over driveway. Concrete driveway and cement floor in sales room. Built up gravel roof. Basement under sales room with heating plant, toilet and air compressor. Gasoline tanks under driveway with fill boxes at curb.

Our advice is to use only the best air hose in twenty-five-foot lengths and see that it is equipped with the best air chuck obtainable.

Our advice is to use only the best air hose in twenty-five-foot lengths and see that it is equipped with the best air chuck attainable.

If you are going to have a free service of any description, do it in such a way that the public will be attracted and recognize its value.

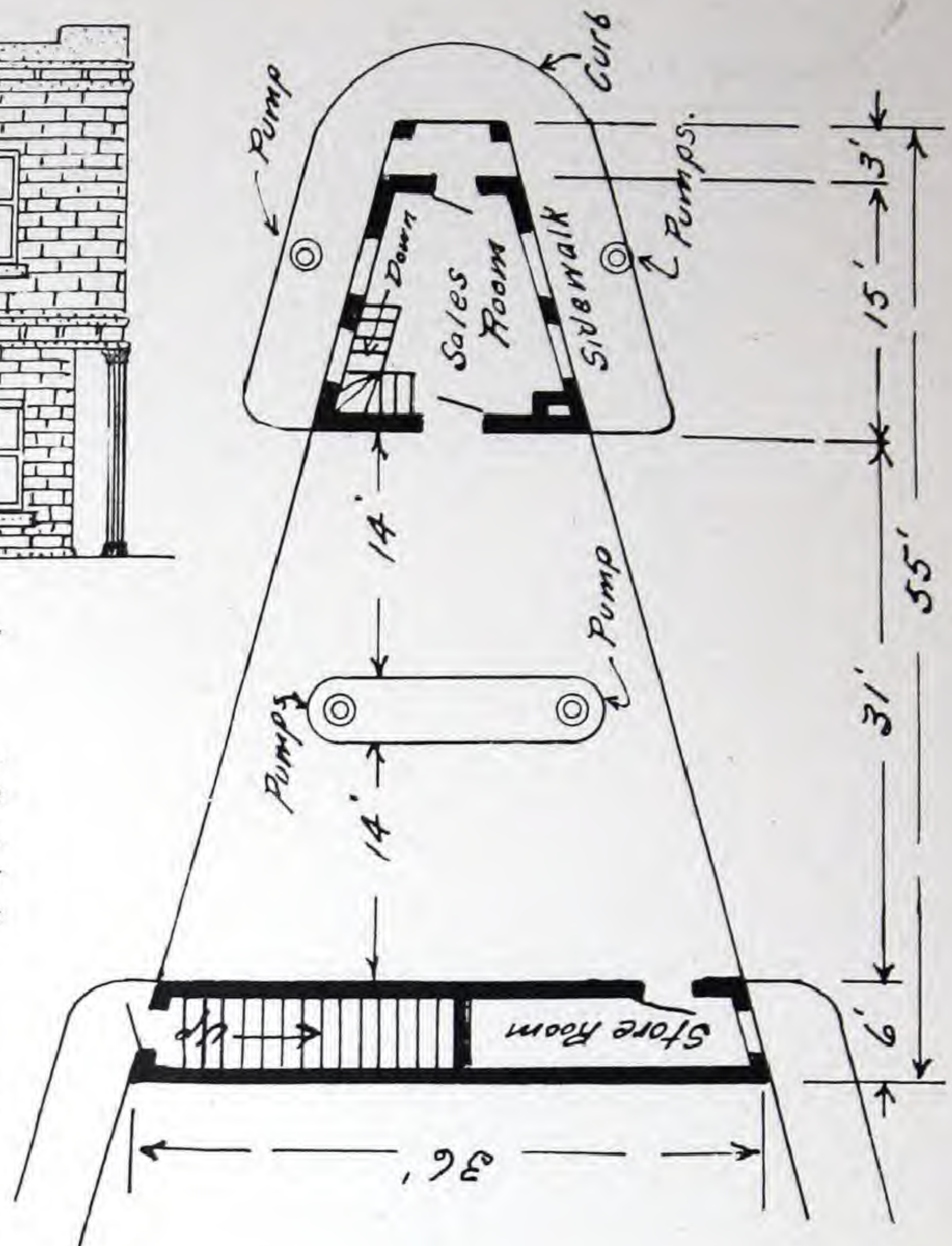
A few of the companies are using a combination air and water post; others are using a pipe standard equipped with a swinging counter-balanced arm that lifts the air hose up from the ground when not in use.

When water taps are located outside of the building, they should be equipped with a self-draining, non-freezing shut-off.

Do not operate the air compressor in the sales room if any other space can be used. This is disadvantageous both on account of the noise and the opportunity for customers to meddle with it. If it must be placed in the sales room, be sure to cover it with a sheet metal case.

See that the compressor and its motor are properly installed and oiled at such intervals as recommended by the manufacturer. Often compressors are automatically controlled and proprietors fail to give such machinery due and regular attention.

Floor space is always at more or less of a premium in a filling station. It is, therefore, necessary to secure a compressor that will occupy a minimum of floor space and at the same time have a capacity equal to the requirements placed upon it. Many manufacturers now have compressors on the market that are small and compact, but nevertheless are very efficient. Several of the new models are using a vertical instead of a horizontal tank with the compressor, motor, etc., mounted on top of the tank.



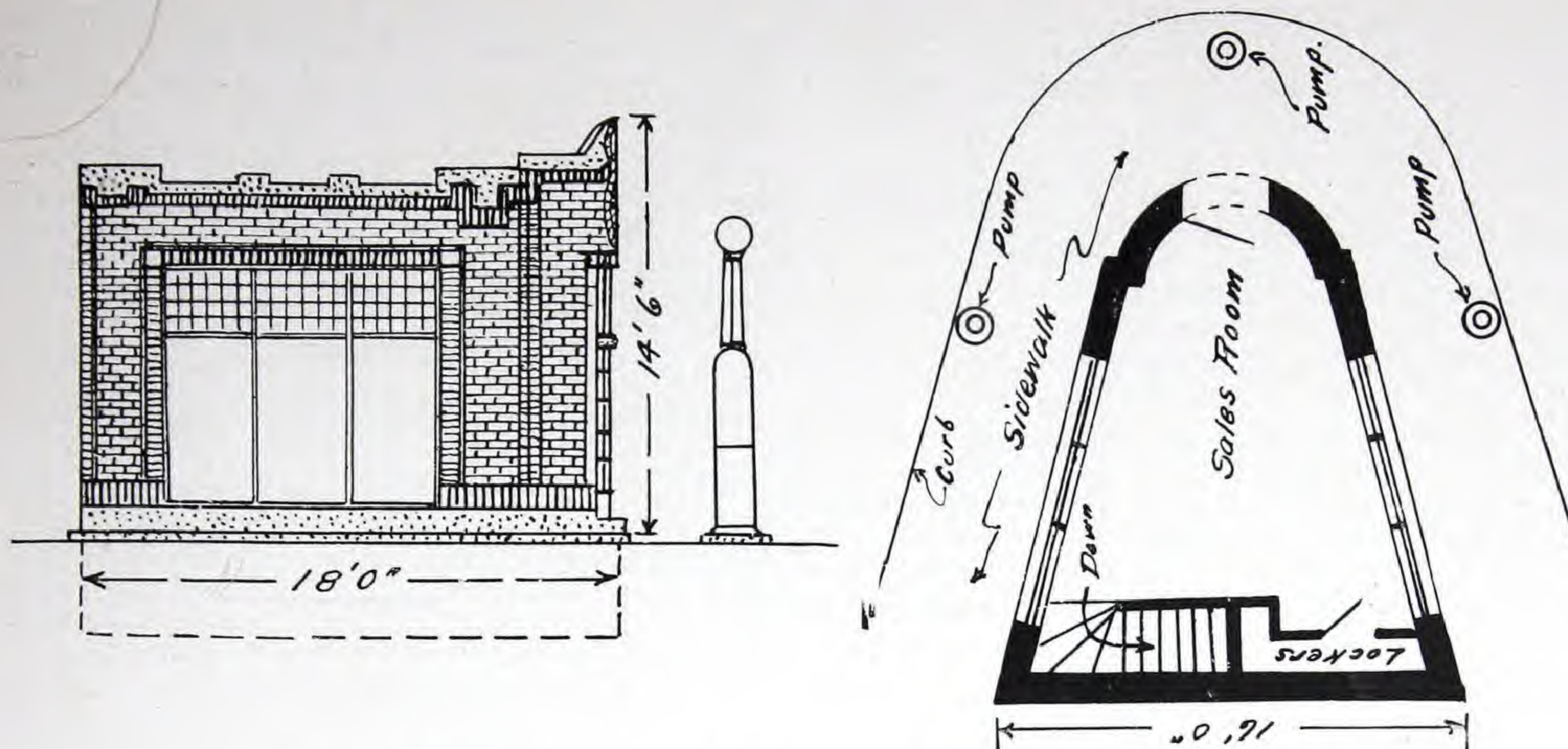
The buyer should assure himself that the automatic starter and cut-off are absolutely positive in their action and that the tank is of such thickness of metal and the seams are so made that there is little possibility of an accident. Several very costly accidents have occurred at filling stations due to light weight tanks and automatic cut-offs refusing to work. Compressors known as the two-stage type are most desirable for filling station use.

The tank should be of not less than three-sixteenths inch steel. Some localities require one-quarter inch tanks. The capacity should be four cubic feet to eight cubic feet, and should show a hydrostatic test of from three hundred to four hundred pounds pressure and have a working pressure of not less than one hundred and eighty pounds.

The compressor should be able to deliver from $2\frac{1}{2}$ cubic feet to four cubic feet per minute. It should start automatically when the pressure has dropped to about one hundred and forty pounds and cut out when it has reached about one hundred and eighty pounds. A compressor of this capacity will require a motor of from three-quarters to one horsepower.

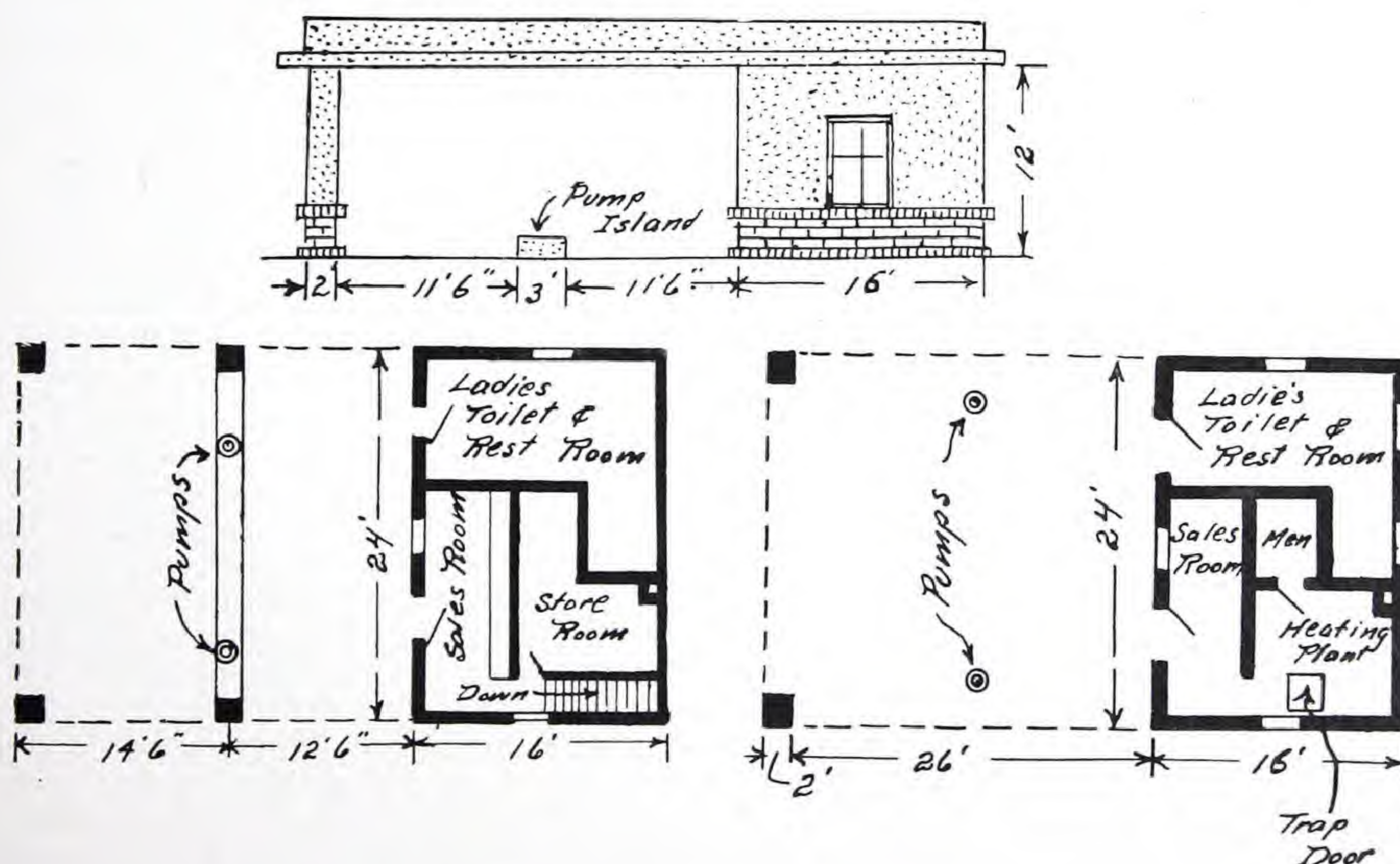
Painting

Do not use loud and gaudy colors either inside or outside of the station. There are a large number of stations throughout the country that are decorated in such a manner as to have a tendency to repel patronage rather than to attract it.



Curb station type. Building to cover small triangular lot. Air compressor, toilet and heating plant in basement. Building of bricks trimmed with concrete. Center window on each side to be of swinging type. Concrete floor and built up gravel roof.

—Printed by permission of Automotive Journal Publishing Company of Pawtucket, R. I.



Semi-fire proof construction. Frame of 2"x4" timbers. Brick veneer to window sill line, stucco on lath above. Inside plaster on lath. Ceiling of driveway cover, ornamental steel panel, balance of cement stucco. Concrete floor. Built up gravel roof. Wood stairs.

Driveway roof built with and without center supports.

When basement is used, it contains men's toilet, hot air furnace and coal room. Concrete basement floor. Air compressor in store room.

When full basement is not used, compressor is housed in a sub-basement about 6 feet square with entrance through trap door and iron ladder.

A dark color such as solid black, dark green or brown is best for the inside finish and should be used from the floor up to a height of three or three and one-half feet, or to the window sill line. This will materially aid in keeping the walls from showing dirty and greasy hand marks and will not show so plainly the dirty splashing which results from cleaning the floor. The balance of the interior should be a light cream, buff, very light grey, green or white in order to obtain the best effects. These shades are clean in appearance and give the best results as far as lighting is concerned.

Dark colors are better for the exterior up to the window sill line and should be used particularly when soft macadam, cinder or dirt drives are used. Doors and door casings should also be of a dark color. It is preferable to have balance of the exterior in a light color. White shows up the best both by day and night.

It is seldom necessary to paint brick work unless a very cheap, inferior grade of brick is used.

When building is of concrete with smooth floated or plaster finish, it may be either painted or enameled.

Everything about the station or grounds should be painted at least once each year, preferably as soon as the weather has become settled in the spring. Stations finished in white or extremely light shades of color will probably have to be repainted twice a year, spring and fall, particularly when located in the larger cities where there is any amount of smoke and dirt.

A station which is otherwise in perfect condition and giving a high grade of service can easily lose business because its paint is in dirty, discolored or otherwise bad condition.

All pumps should be painted twice a year and oftener if necessary. Do not let them look dull or dingy. Gasoline pumps and oil containers will lose their lustre in time, even though finished in a most careful manner. This is due to fumes, small spillage, and exposure to all kinds of weather. White is not recommended for this class of equipment, as gasoline and lubricating oil will turn it a dirty streaked yellow in a short time. It is also an extremely hard color to refinish smoothly.

When repainting a station, see that all bad spots are cleaned, blisters removed and scraped. Be careful to note that all steel or other metal surfaces have rust removed and then given a coat of the best metal primer. Do not paint on a surface that is damp.

Use only high grade paints. Cheap, inferior grades will cost you more money in the long run. When stations have a plaster finish inside, use paint only. Do not try to save expense by using whitewash, water paint or calomine.

Insist that all paint used on buildings and about the grounds shall be pure white lead or color ground in oil. The finish for gasoline pumps and lubricating oil tanks should be a color varnish or lacquer.

When several stations are to be painted, a considerable amount of saving can be effected by purchasing the white lead, dry tinting colors and raw linseed oil in bulk and mixing them on the ground.

Do not endeavor to hurry the painting work. See that one coat is thoroughly dry before the next one is applied. Allow driers to be used very sparingly and then only by a man who understands its effects.

Signs and Advertising

Advertising at a filling station may be termed as being of two classes, direct and indirect.

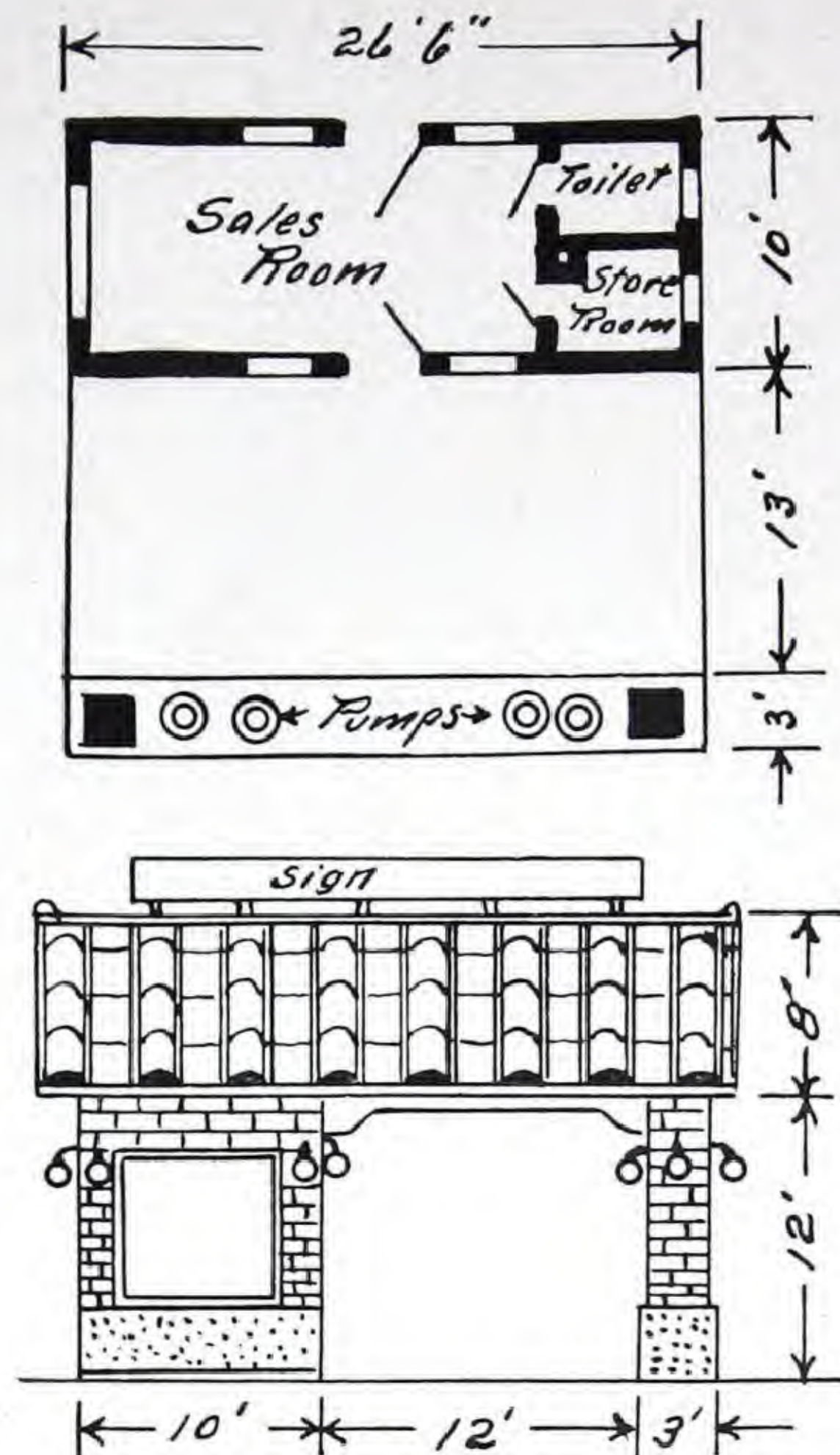
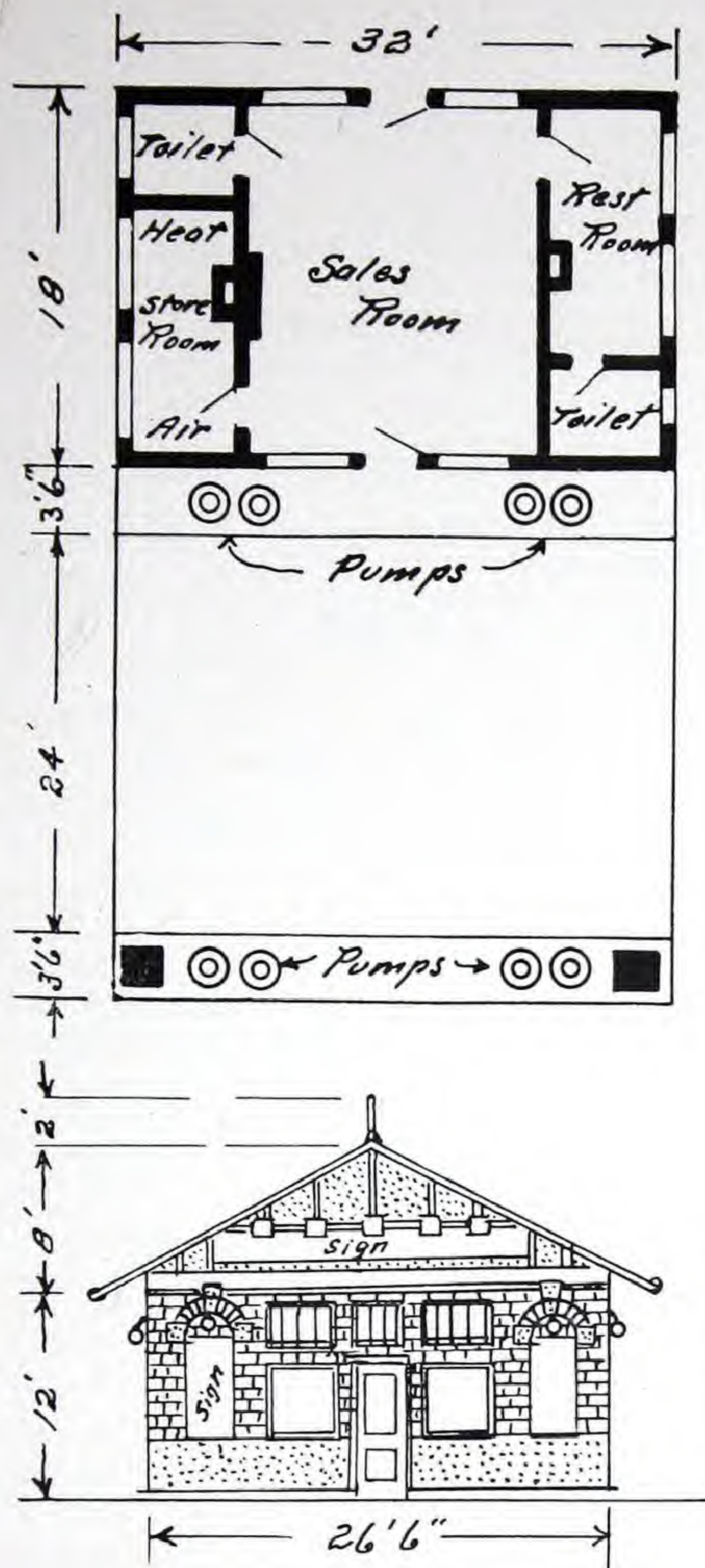
We have, for some time, been of the belief that the latter is more effective and pays bigger dividends than the former. Indirect advertising consists almost entirely in a service given to your patrons, and is usually very inexpensive when considered in the light of advertising. Your free air and water stations come under this class. Other items are the arrangements for your patrons securing a good drink of cold water, summer and winter, the appearance of your building, grounds and drives, the manner in which station is lighted at night, and the courtesy offered your patrons.

One company has a small, four page folder showing the roads of their own and adjoining counties. It also gives a list of the best garages and hotels, and their rates, condensed timetables of railroads and steamship lines entering the city and the principal points of interest. On the front page is a list of all their service stations in their own and adjoining cities.

Another company believes that information of this character should be given verbally. This method is all right, except—when the attendant is very busy, is affected with the disease commonly known as “grouch” or does not know. To give a patron a wrong direction or wrong information or to give it discourteously is worse than telling them nothing.

Under the head of direct advertising we consider all signs, etc., actually on the ground. Our opinion is, that the design of the building, its location on the lot, the driveways and the pumping equipment should show the class of business being conducted and that about the only thing necessary in the way of a sign is the name of the company. This should be in a plain block letter suitably placed on the building. It should be of such size as can easily be read at a distance of one hundred and fifty feet. A plain electric sign with only the word “gasoline” and so placed as to be seen some distance at night is good practice and will also help to light the grounds. If accessories or tires are handled, the two words well displayed will be sufficient. Do not allow the building or its grounds to be plastered with the small tin and paper signs of tire and accessory manufacturers.

Large bulletin boards very seldom improve the looks of a station and they usually hide a portion of the building or its equipment from some angle, to the approaching driver. They are certainly



Fire-proof construction. Concrete to window sill line, brick above to eaves, balance stucco veneer on brick with wood trim. Inside finish of white glazed tile or plaster with mission finished wood trim. Tile roof and concrete floor. Ornamental pressed steel for all ceilings including cover over driveway. Heated by gas fireplaces or hot water system with gas hot water heater.

detrimental when the station is located in a good residence district. However, if it is decided to use bulletin boards, see how little you can put on and not how much, and see that what you do put on carries a "punch" with it. The size in most general use is ten feet wide and eight feet high, and is usually placed between ornamental posts and about three to four feet above the ground with a lattice underneath.

When placed at a station located on an inside lot, a bulletin board usually comes into view one hundred to two hundred feet before passing it and will remain easily within the vision of the driver for a distance of from fifty to one hundred feet. When located on a corner lot, this distance may in some cases be doubled. This means that if a car is being driven at a speed of fifteen miles an hour the driver must absorb it in two to six seconds, or it has failed in its mission. Careful spotting has proven that the man who goes into a filling station for service does not read these bulletins while at

the station. We have seen bulletin boards containing not over five words which have told the whole story and carried a good point and could be easily read and absorbed while a car was passing at ordinary driving speed. We have also seen the same type of signs contain as many as twenty-one words and which contained no more meat than the one of five words and was so jumbled together that it would be impossible to read more than a small portion of it while passing.

Pictorial signs are very seldom desirable for filling stations.

The color to be used in sign work is a very important matter. They should be such that they will blend with the station and its trimmings. For this class of work, two colors besides the background is enough. Black, dark blue and green or a brilliant red on a white or lightly tinted background, or a bright orange, white, light blue and green will show on a dark background. Dull reds

never look well or attract the attention in sign work. All colors outside of black and white will fade more or less, making repainting at frequent intervals necessary and consequently increasing maintenance charges.

Companies having a trade mark, should, when possible show it at a filling station, either on the building or on the bulletin boards, when they are used.

The placing of bulletin boards or other signs about a filling station should be very carefully worked out. If possible get a representative of some outdoor advertising concern who is well versed in this work to assist you.

Parking Areas and Care of Grounds

The parking areas, that is—those portions of the lot not actually used in operation of the station are an important item.

Men and women of all classes, particularly those in circumstances which will permit them to own and drive automobiles, are becoming better educated. This is naturally followed by a greater attraction for things that are beautiful and for cleanliness.

All ground not actually necessary for the efficient operation of the station should be well graded and either sodded or seeded. If these plots are of sufficient size, flower beds will add greatly to the appearance. A few shrubs can also be used with nearly all stations. A well trimmed hedge of California Privet along the edges of the driveways in connection with shrubs along the back of the lot gives a very pleasing effect.

Several stations belonging to a small company in the west have been made unusually attractive by training American Ampelopsis vines over the building and over fences in the rear. Other companies are using large flower urns in their grounds, while another has at each station a very handsome fountain about ten feet in diameter filled with electric lights of different colors and which attracts a great deal of attention at night.

Well-designed ornamental light posts located at either side of the approach to driveways and at such other points about the grounds as necessary will attract attention and also serve to reduce the accident hazard at night. These may be of concrete, brick or ornamental iron.

Some companies are using artistically designed fences or walls of wood, concrete or brick to enclose all sides of the lot not open to the street.

Extreme care should be exercised to see that the grounds and everything about the building is kept scrupulously clean.

Lawns should be trimmed at least once a week and oftener when necessary. Do not neglect the trimming of the edges and around lamp posts, etc.

When driveways are of cement they should be flushed with the hose and swept every day, except in freezing weather. All sticks, paper, matches,

etc., should be picked up from the entire grounds at least twice a day.

In winter all driveways should be shoveled and then swept to their entire width.

Windows, globes on light posts and pumps, etc., should be washed twice a week and oftener when the station is in a locality where there is a great deal of dust or smoke.

Door cases and frames should be washed every few days to clean off any dirty or greasy finger marks.

Small Equipment and Tools

There is nothing more disgusting to a customer than to drive into a station and find that it hasn't the necessary tools and small equipment to properly care for his needs.

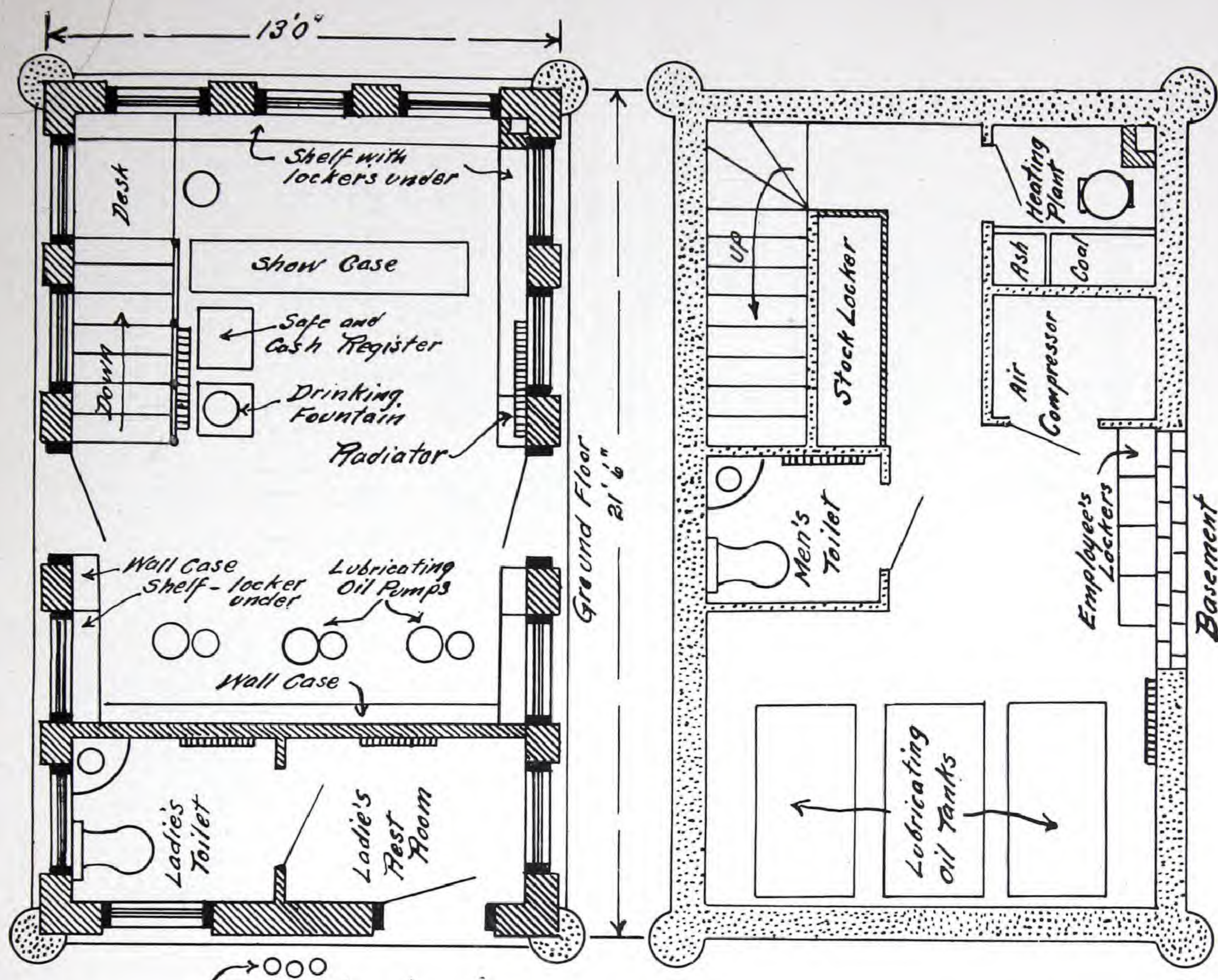
The operation of a filling station is not very much different than any other business inasmuch as the absence of the tools necessary for good service, operating efficiently, and proper maintenance will react in the form of a loss of business, high operating and maintenance charges, thereby decreasing the profit to the owners.

When the business is opened, all tools and equipment should be carefully inventoried and charged against the attendant and receipt taken. They should be inventoried at intervals of not to exceed sixty days, while thirty days would be better. This should be done just as carefully and accurately as the inventory of merchandise. If attendants are discharged the tools and equipment should be checked with them. This also keeps the records of the new attendant most satisfactory.

When tools are lost or carelessly broken they should be charged against the attendant and deducted from his salary. This will soon insure a full complement of tools at all times, and teach the attendants care of equipment.

Every station should keep on hand in a regularly constructed tool locker such special wrenches as are necessary to take off the gas tank and oil tank covers of all cars. Even though the owner may have one, he dislikes to dig around in a tool box or under the seat to get it out. The station should also have a good pair of automobile pliers, a one-pound machinist's hammer with a ball pien, a good eight-inch screw driver with five-sixteenths inch bit, a ten-inch electrician's screw driver with one-eighth inch bit, and a ten-inch money wrench. We do not believe it is necessary to furnish the customer with a tire gauge.

Some operators are furnishing their attendants with flashlights. The principal of this is all right, but we believe a better method is to have a push socket installed on the outside of the building and furnish the attendant with an extension light of No. 14 armored cable and equipped with a vapor proof cage. The initial cost may be more, but maintenance will be less. In addition to this, flashlights can never be found when needed and are easily misplaced and stolen. Small gauge sticks marked in inches, for gauging the tanks on patrons'



Floor Plan and Basement showing a good working arrangement of fixtures and equipment.

cars should always be on hand and kept where they can be found without keeping the customer waiting. There should be one gauge stick accurately graduated to quarter inches, for gauging the stock in tanks. If these are painted black and varnished, they will be found to give better results.

The following tools and equipment will be found necessary for the upkeep and maintenance of a station:

Eight-foot stepladder.

Rake.

Two warehouse brooms. (One for inside of building and one for driveways.)

Sponge.

Window rubbers.

Lawn mower.

Sheep shears for trimming edges of lawn.

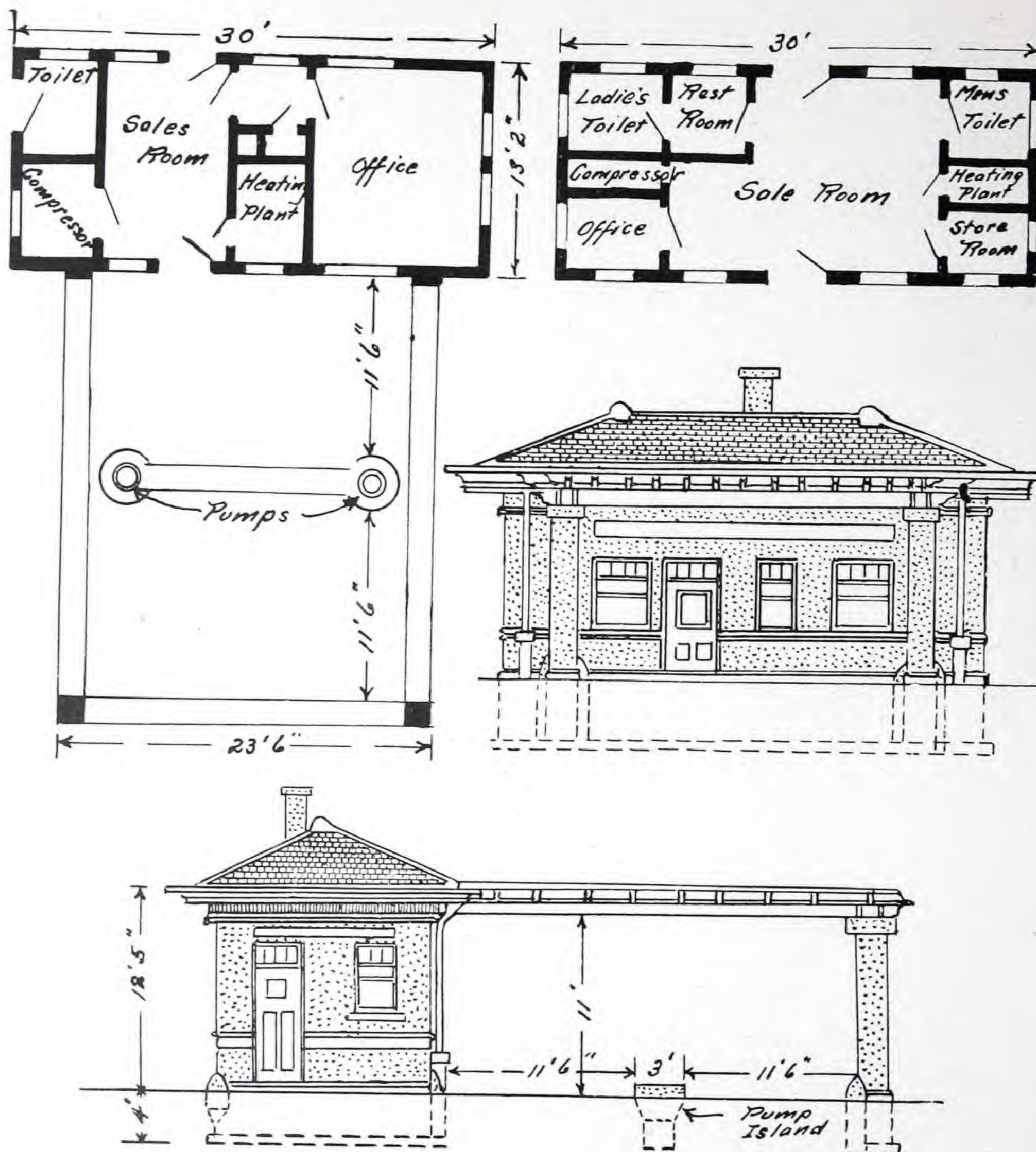
Fifty feet of three-quarter inch garden hose with nozzle and reel.

Snow shovel.

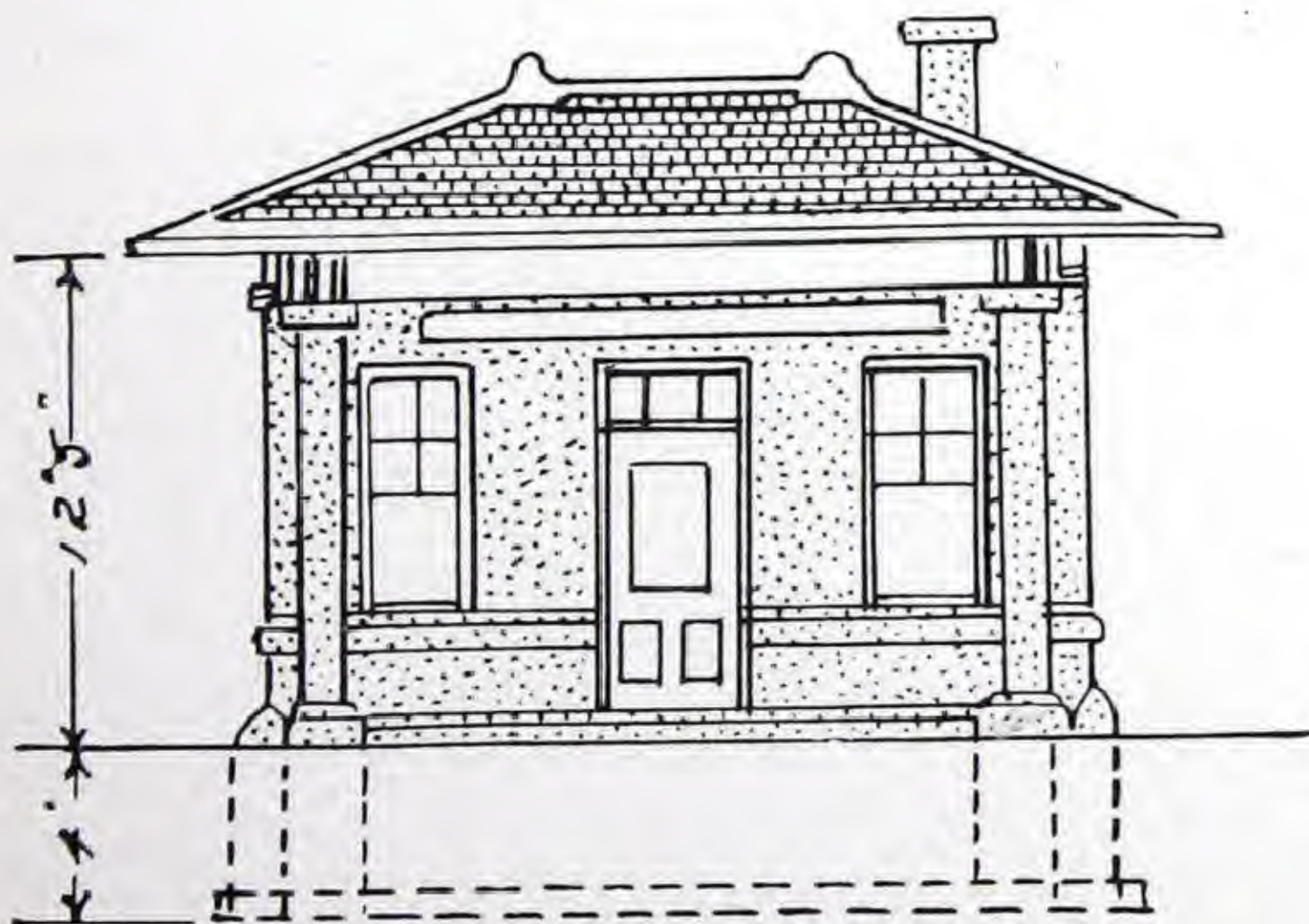
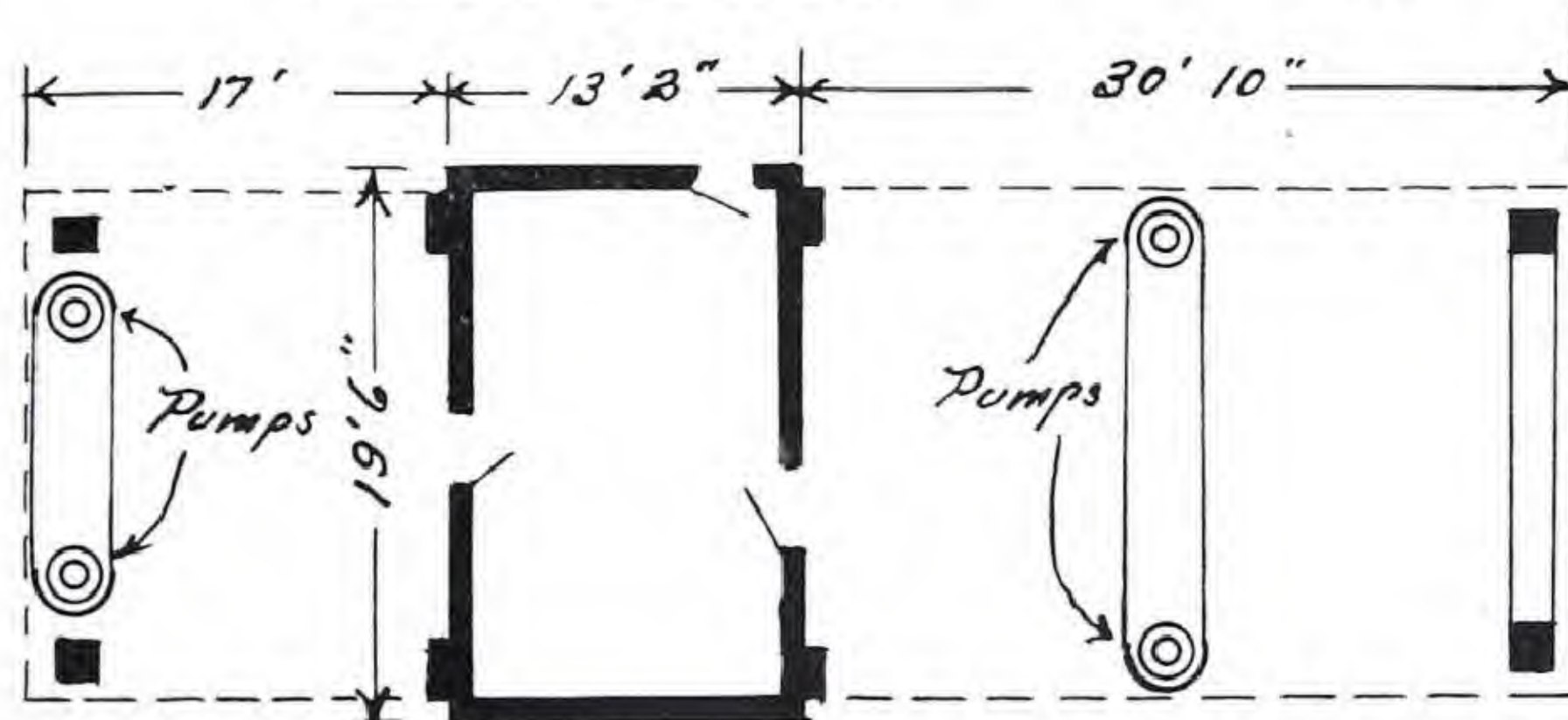
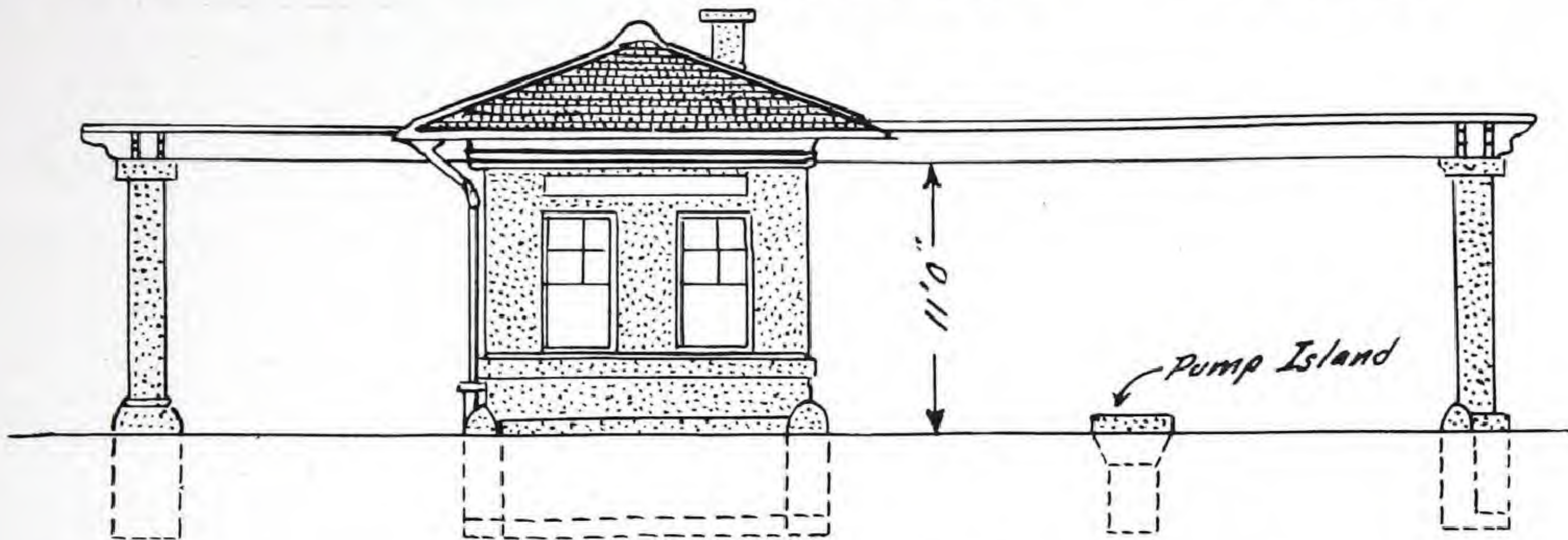
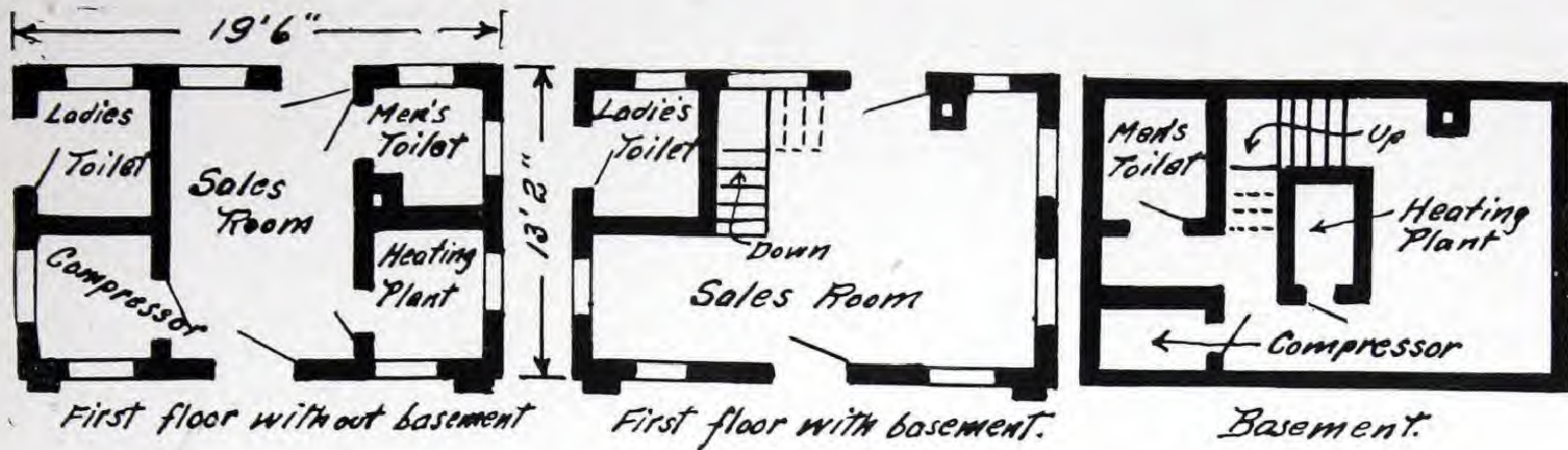
If several stations are operated in one city, a traveling janitor or porter can be employed to good advantage. When equipped with a small car, he can carry some of the tools with him, and relieve the necessity of having them at each station. He can also carry a small quantity of paint and touch up such places as require it, and make small repairs.

Every station should be equipped with at least two one-quart fire extinguishers of the carbon tetrachloride type. It would be well to have another two and one-half gallon extinguisher of the soda-acid type. These should be placed in plain view where they can be very easily reached in case of emergency. Every attendant should be fully instructed as to what class of fires each is best designed for. If occasion demands their use, they should be cleaned and recharged the same day. Do not postpone this work until tomorrow.

There should be a pint, quart and two-quart measure for each grade of lubricating oil handled. Measures or funnels should be equipped with flexi-



May be fireproof, semi-fireproof or non-fireproof construction and can be built with or without covered driveways. No basement.



May be constructed as fireproof, semi-fireproof or non-fireproof. May be built with or without basement, also with or without covered driveways. May have either one or two toilets.

ble tubing or some similar arrangement to allow the attendant to reach the openings in oil reservoirs without spillage.

A five-gallon approved safety can for gasoline should be kept on hand for the use of customers whose cars have run out of gasoline at some distance from the station. This class of service is most essential and will create an abundance of good will. The general practice is to collect for the gasoline and require a deposit equal to or greater than the value of the can before it goes out, and to return the deposit when the can is returned to the station.

Study of Laws and Ordinances

Regardless of whether you are leasing or buying the real estate which you intend to use for a filling station site, have the title papers carefully examined as to use for business purposes, class of buildings, their position on the lot, or other building restrictions, etc. Also examine local ordinances, building code and court ruling for the same items.

Local ordinances, local building code, state laws, State Fire Marshal's orders and court rulings should be examined relative to the storage and dispensing of hazardous liquids, the size, location and class of tanks which may be permitted, the location of fill boxes and pumps. This likewise applies to the location and size of driveway approaches.

The local sealer of weights and measures should be interviewed as to the installation, testing and sealing of the pumping equipment. The kind and position of the advertising matter which you may place on your property is another thing which is covered by local ordinances in a great many cities.

Do not try to evade the laws. Public officials are usually men of business and consequently reasonable and if existing laws or ordinances are really detrimental to the best interests of all concerned, they can be repealed or amended.

It is also a splendid idea to consult with insurance men, in order to know that you are conforming to recommendation of the National Board of Underwriters under whom they operate.

The local boiler inspector or Board of Public Safety will probably have jurisdiction over the air compressor and designate the tank specifications.

Everything under this heading should be carefully gone into before any work is actually begun.

We have known of several stations that were practically completed before it was discovered that they were over-stepping the law and had to be torn to pieces or abandoned at a loss of several hundreds of dollars.

Operating Methods

A great many individual operators and some of the large oil companies are apparently of the belief that as soon as a station is constructed and ready for business, it will in a large measure, operate and continue to take care of itself. As we have stated before, a company operating filling stations is in a great degree, a public service corporation.

Every day watchfulness will bring success, while a little neglect may bring failure. In this respect, it is no different than any other class of business.

The principal thing to consider is to operate the business in such a manner that you can rapidly and efficiently serve your patrons. This can be accomplished by carefully planning your station as has been already outlined in this article. Don't fail to render them such service as will add to their comfort and make them feel a desire to return. There is, however, a limit to this which is controlled by the margin of profit on which stations are operated.

Install the necessary toilets for the convenience of your patrons. See that they are always absolutely clean. Do not let them be used as a clothes locker or as a store room for tools or stock. Keep wash bowls spotless and always supplied with good soap and clean towels.

Handle only the best grades of gasoline and oils and then tell the truth concerning them and educate your patrons as to what constitutes good gasoline and good lubricating oil. One company has at each of its stations, a very attractive display rack, containing samples of its lubricating oils in the ordinary four-ounce oil sample bottles arranged in such a manner as to show their viscous properties and color. The attendants are schooled as to how to intelligently demonstrate these samples to a customer.

Insist on the finest courtesy to every customer from every attendant at all times and under all circumstances. Courtesy will bring you more trade than all the free service you can possibly originate.

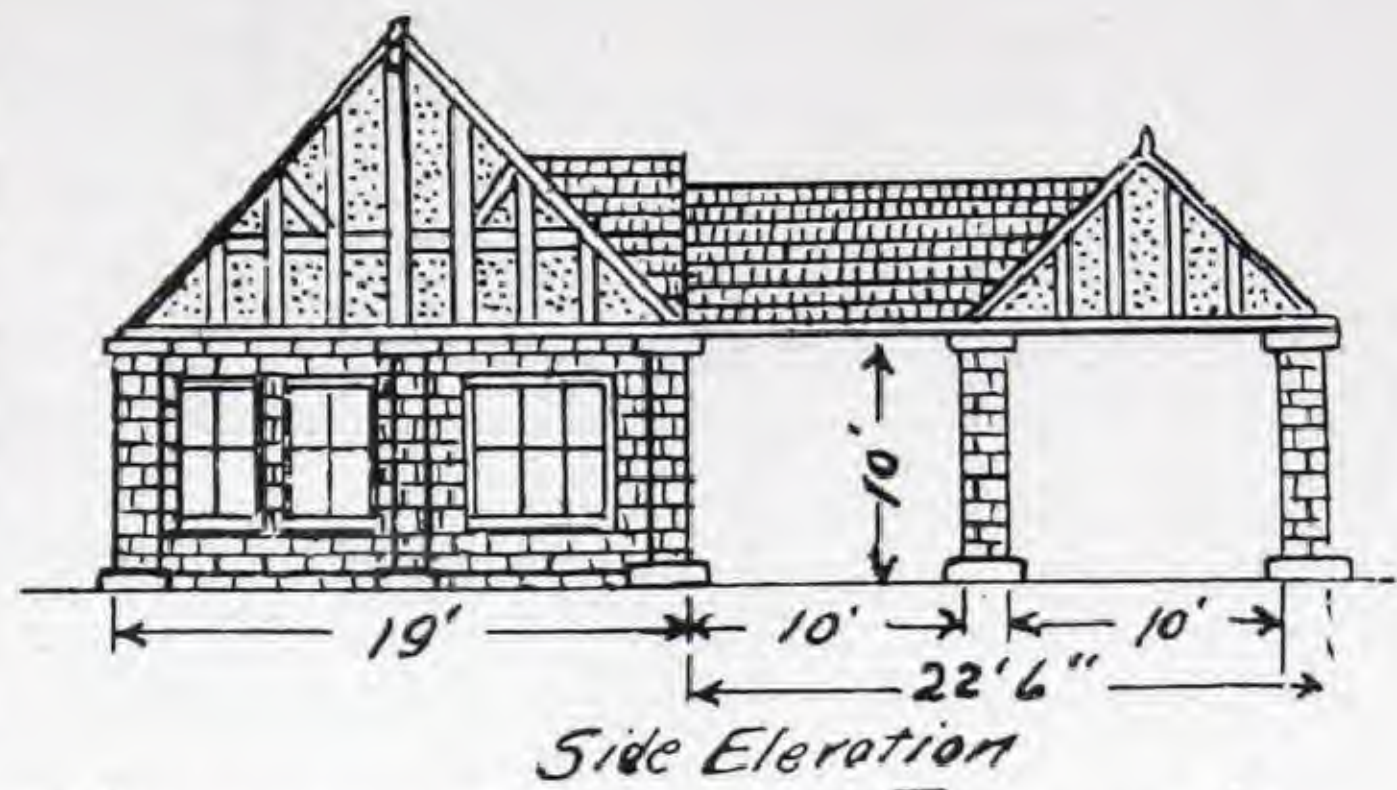
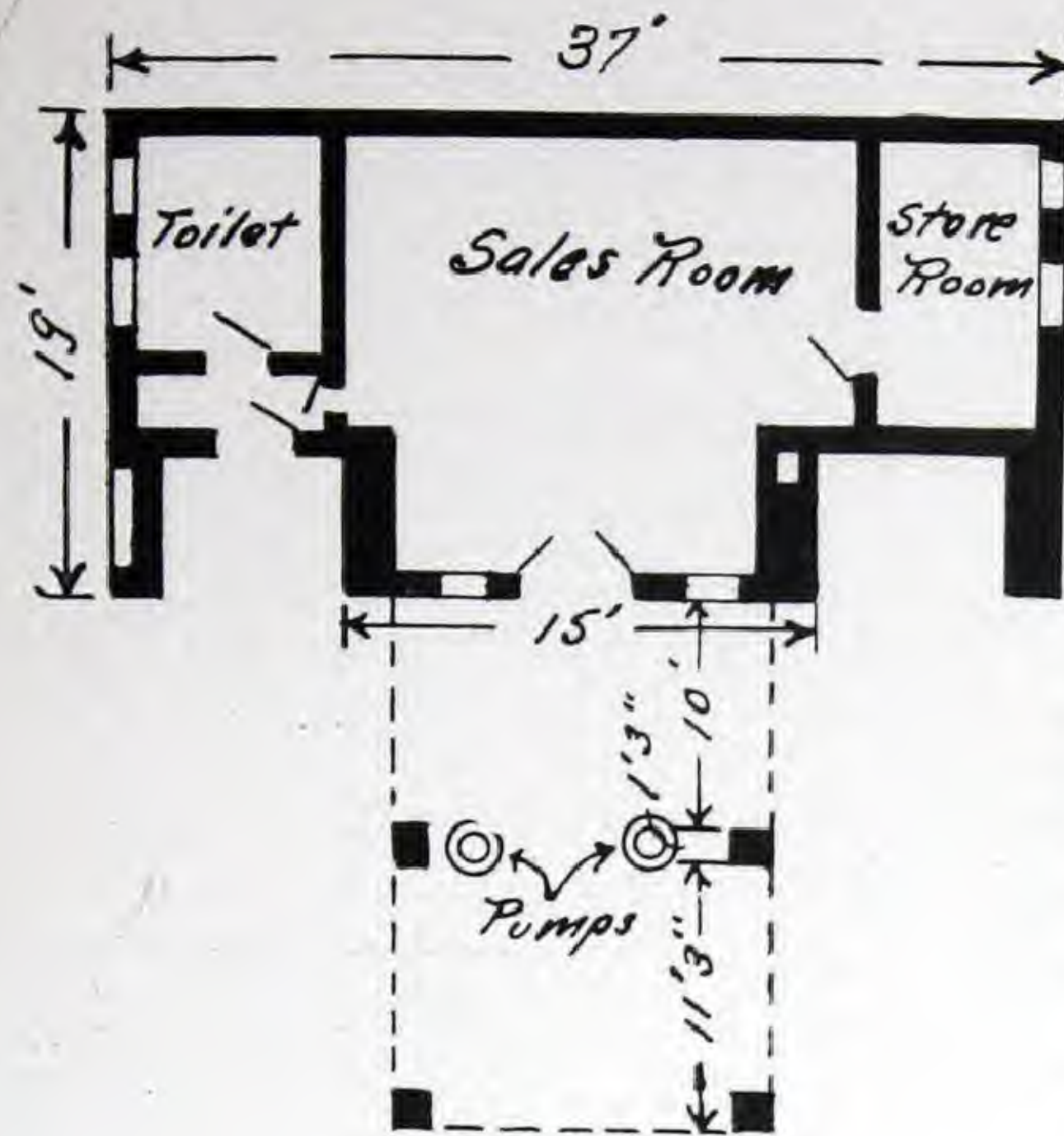
Attendants should not allow car owners to take off or replace gas tank and oil tank covers or to raise or lower hoods. Attendants should supply them with water when necessary. It is not always possible in small stations or during rush hour periods of large stations for attendants to serve customers with air.

Cleanliness is another important factor in the success of a station. Keep the building, grounds and everything connected with their operation in perfect condition at all times.

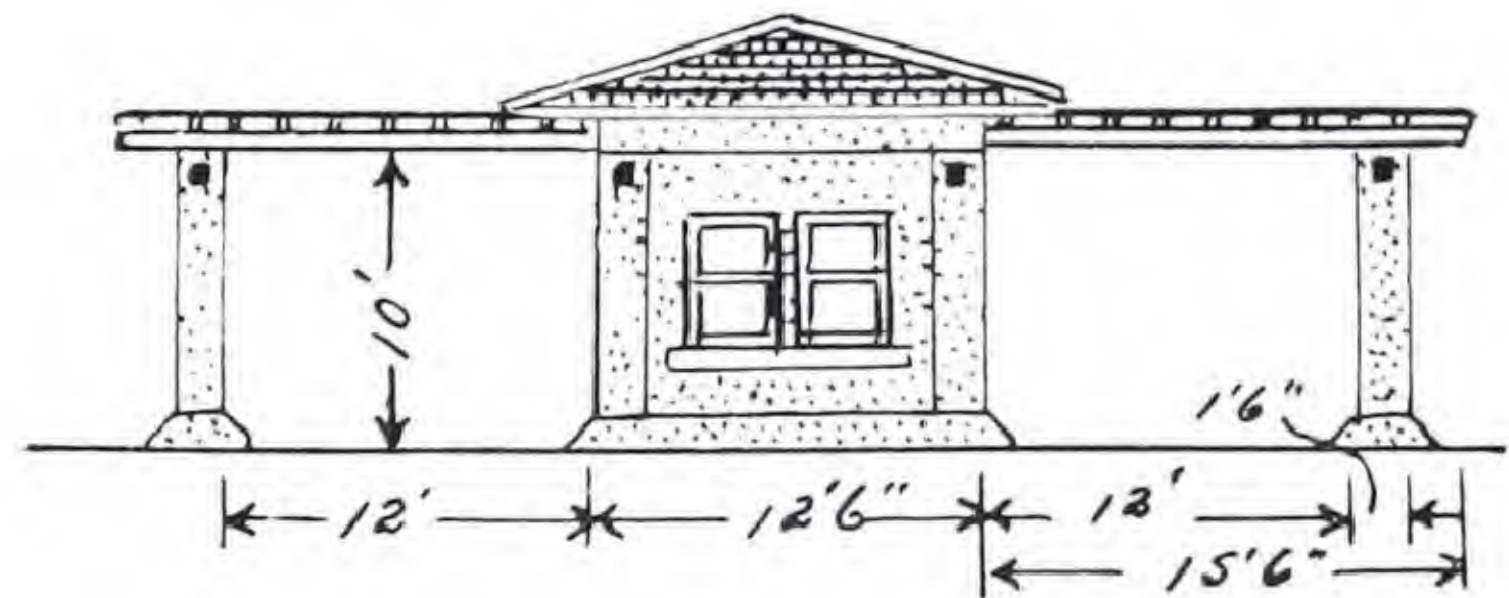
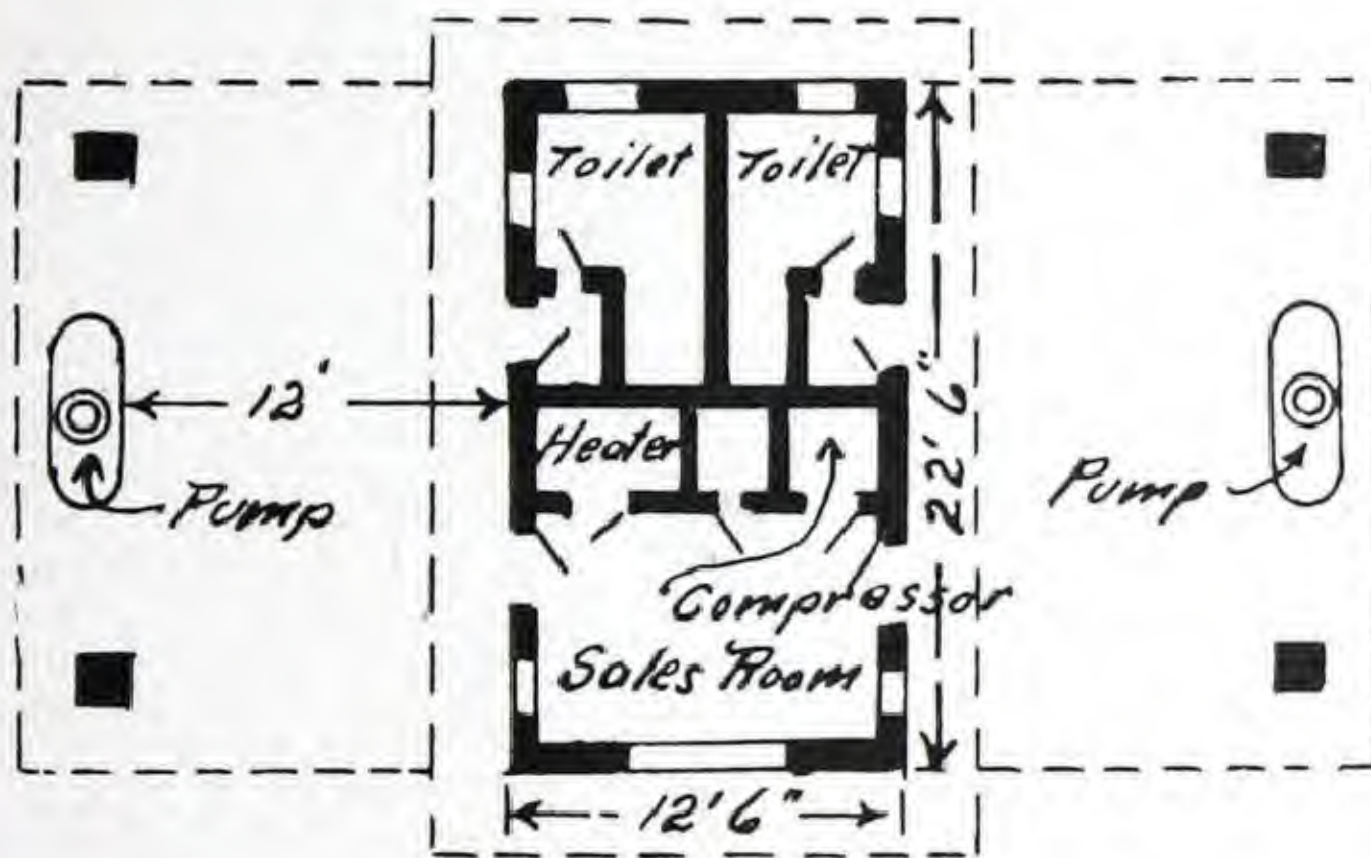
When possible, attendants should be provided with uniforms and these should be changed for clean ones as often as is necessary. An attendant should not be allowed to let his clothing or hands get into such a condition that there would be any danger of soiling a patron's car or hands when making change.

Do not allow your station to run out of any commodity which you advertise to carry in stock. To tell either a regular or transient patron that you are out of gas or a certain grade of lubricating oil is equivalent to saying the station is mismanaged.

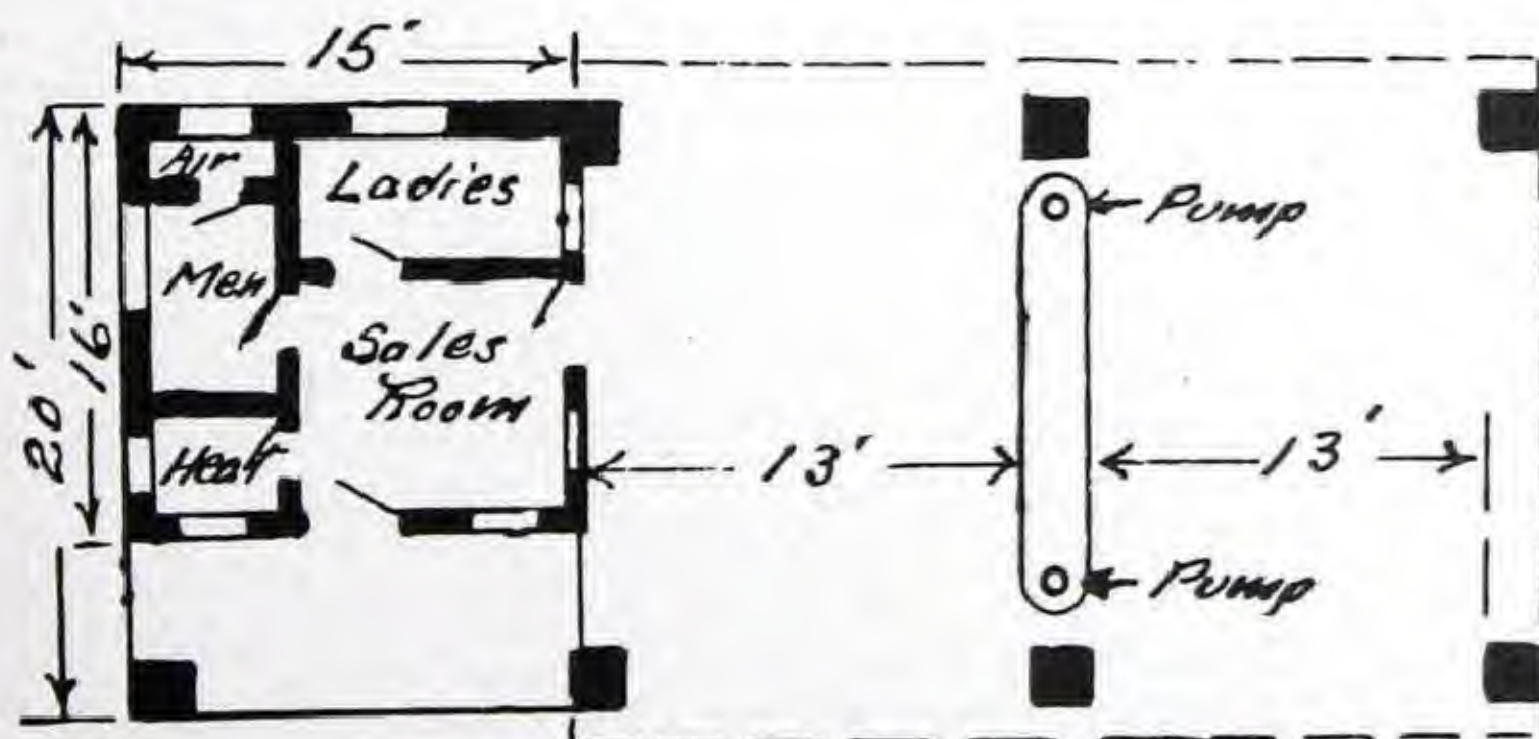
There is one thing that is neglected in practically every Filling Station and that is the accommodation for a good drink of water, especially in the summer. A great many managers seem to think that when they have installed running water and a



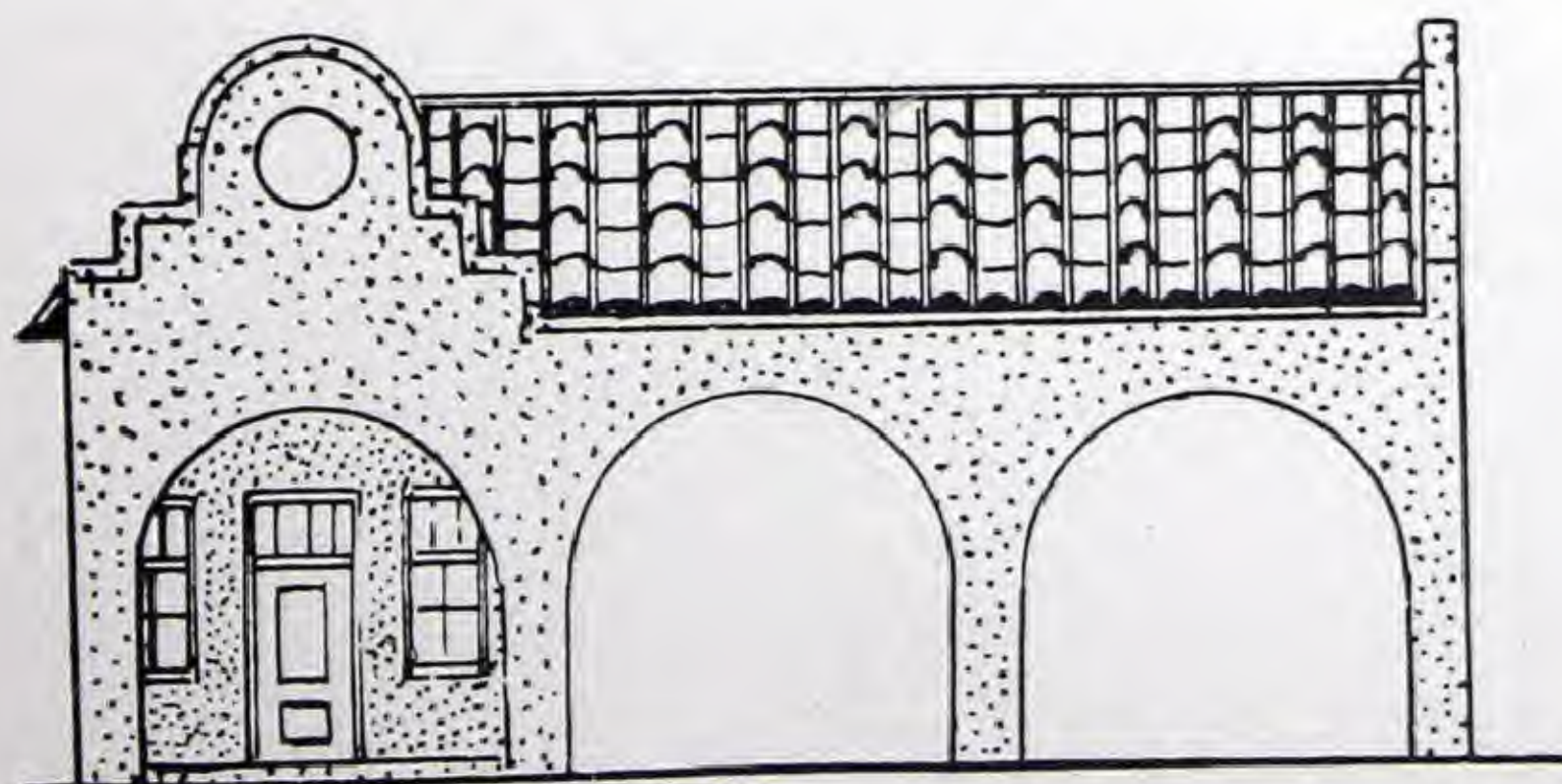
Building and driveway roof supports to top of window line, balance of stucco finish with wood trimmings. All of roof of timber with shingles. Inside walls and ceiling of plaster on lath. Concrete floor.



Building of concrete with smooth cement finish. Inside walls and ceiling, cement plaster on metal lath. Concrete floor. Asbestos shingle roof. No basement.



Building of solid concrete. Cement floor and tile roof. Plaster finish inside.



faucet from which you can get undrinkable water in the summer, they have done enough. A few stations do have a dirty glass or rusty cup hanging over the faucet.

If you cannot supply a modern cooler with sanitary drinking cups, you can install a sanitary flowing drinking fountain. This is not expensive and it will be appreciated by your patrons.

Do not allow the attendants or tank truck drivers to smoke on the Filling Station grounds whether they are on duty or not. We believe that patrons should also be made to observe this rule. Some of the Companies have a sign conspicuously placed near the pumps which is similar to the following:

**"CARS WILL NOT BE FILLED WHILE
MOTOR IS RUNNING, OIL LIGHTS BURN-
ING, OR OCCUPANTS OF CAR SMOKING."**

It should be enforced in every instance without exception. Fires have been known to start from every one of the three causes mentioned. They have also originated from the overflowing of the gas tank and from the hose coming out of the fill cap while gasoline was being discharged. Great care should be used by attendants to see that this does not occur.

There are several classes of insurance that should be carried at all stations.

The various State Laws usually compel the carrying of compensation Insurance on Employees in some form or other.

Unless the building is absolutely fireproof, fire insurance should be carried.

When driveways are covered, a collision insurance should be carried which will enable you to recover a portion of your losses when damage is done to the building by drivers, without having to go to the customers direct.

The two most important classes, however, are Public Liability and Property Damage. This will protect you from any loss which might occur from a patron being injured or his car being damaged while on your property. One accident of this kind can easily wipe out the profits of an entire year if you are not protected.

Probably one of the greatest evils that is practiced by a few of the smaller companies consists of hiring attendants which are below the average in ability, paying them a small salary and expecting them to make up the difference through the medium of tips secured from the customer. A great many men who were susceptible of developing, have been ruined as far as their usefulness is concerned by being allowed to accept tips. Every attendant should be paid a fair living salary and then be absolutely forbidden to accept tips. To the average man there is nothing more disgusting than to go into any place of business and feel that he cannot get attention, service and courtesy without being obliged to pay an amount over and above the price of the commodity which he desires to purchase.

Checking of Attendants

The checking of attendants not only includes the counting of money, but also the checking of all merchandise stock.

If the tank has already been installed without being strapped or is known to be out of level, it should be "pin-measured." That is,—the tank should be pumped dry; gasoline should then be poured into the tank in five-gallon lots, each lot being carefully measured in a five-gallon sealed measure and poured without spillage. After each five gallons have been poured into the tank, the depth of the liquid should be carefully measured and the measurement recorded.

After the tank is completely filled, the gauge table can be calculated from the measurements thus secured.

No two tanks are exactly alike, therefore a separate table should be prepared for each tank. This also applies to the truck tanks serving the station.

The old method of gauging the tanks by means of a stick should not be used, as an accurate reading is hard to obtain on account of the liability of holding the stick at an angle in the tank instead of plumb.

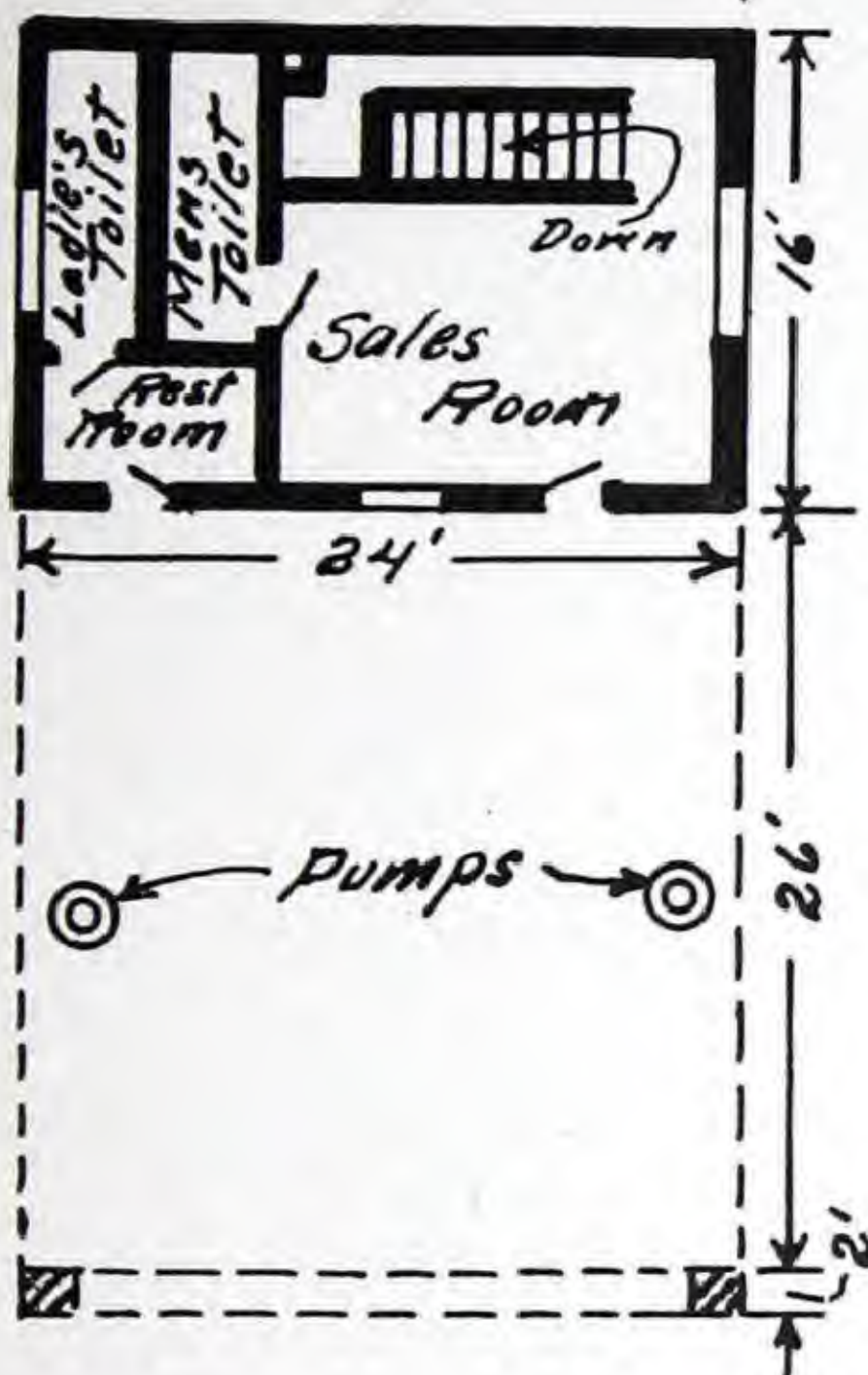
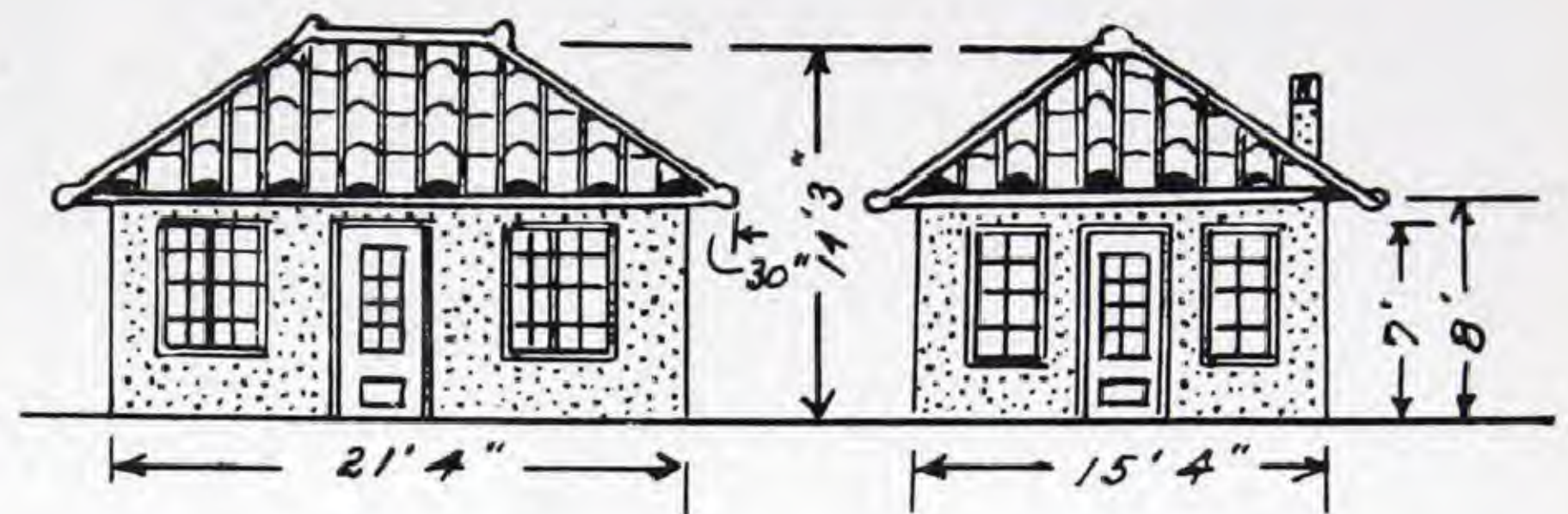
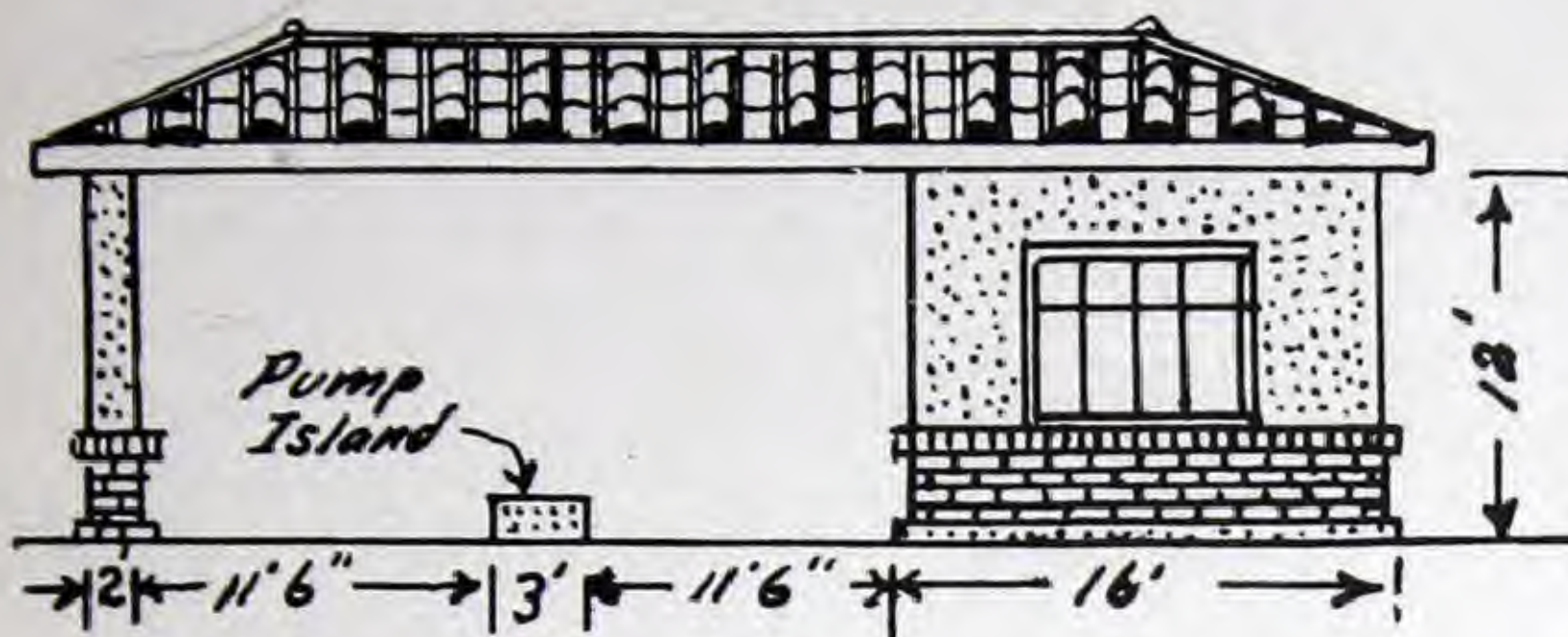
Tires, accessories, oils and greases in cans should be inventoried on a printed form once every thirty days. The writer prefers to see a space provided for this on the regular daily station report. Then the actual inventory can be checked with the perpetual inventory at stated periods.

Additions to these stocks should be receipted for to the truck driver or other delivery source and also entered on the daily report sheet. All sales from this stock should be entered on the same sheet.

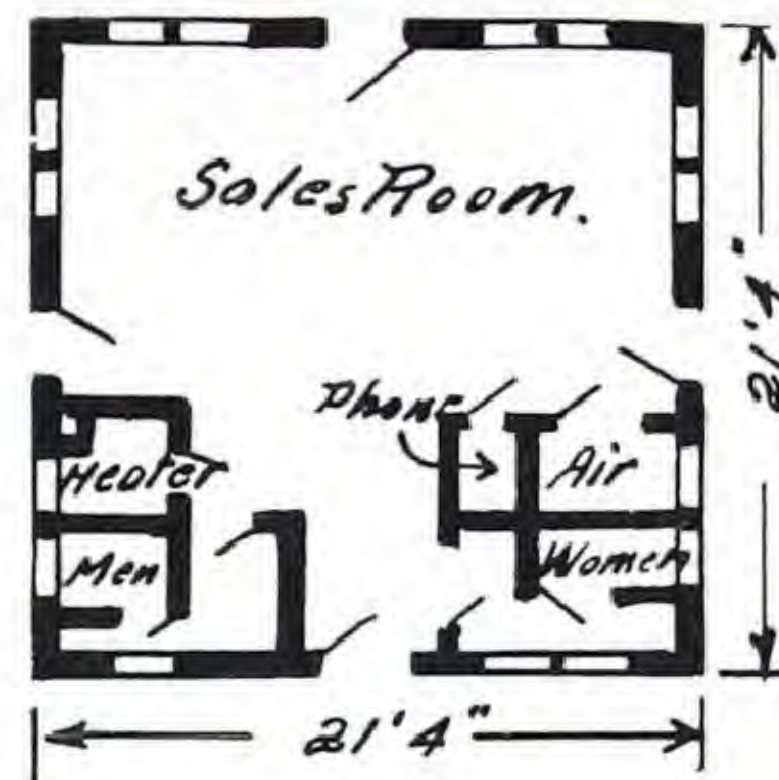
The losses from shortage in gasoline stocks have been a source of trouble to practically every station manager. As a result, several very elaborate systems have been devised for keeping the gasoline records accurately. Some of these provide for the taking of temperatures and make such arithmetical calculations as may be necessary to a correction for expansion or contraction. Another system provides for allowing a shortage of three-quarters of one percent during the summer months, (when temperature is above 80°F) and an average of one percent during the winter months (when temperature is below 35°F). In other words, when the temperature is between 35°F and 80°F no overage or shortage is allowed the attendants.

Many operators have agreed that these systems bring about an extremely accurate accounting, but because of the work involved, and the liability of error that they are rather impractical and almost wholly unnecessary, except at stations having an extremely high daily average gallonage.

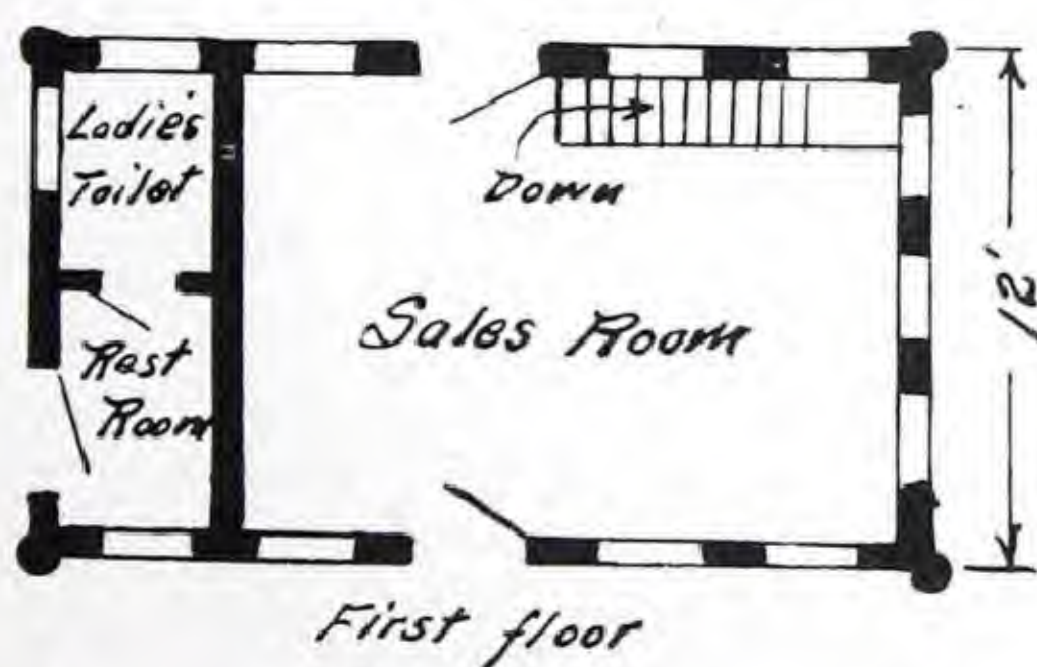
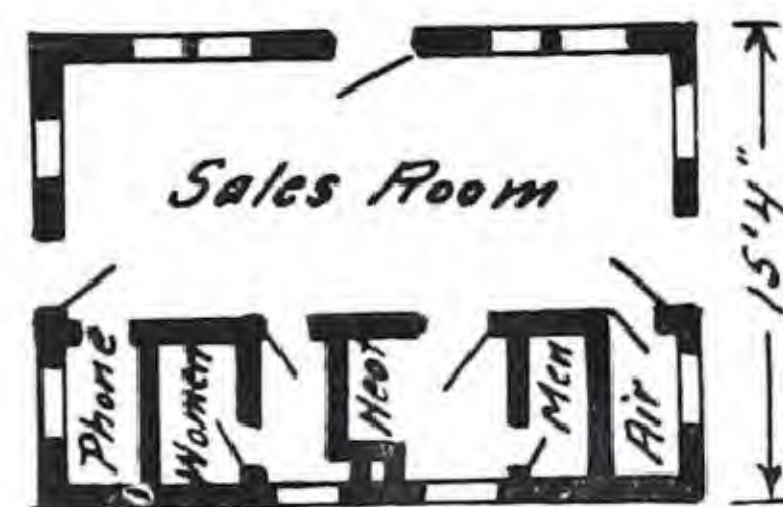
The system which has been found to give the best results and which is in most general use is to have the daily report sheet so arranged as to show the meter readings, gauging of tank and sales for each pump and amount of stock received.



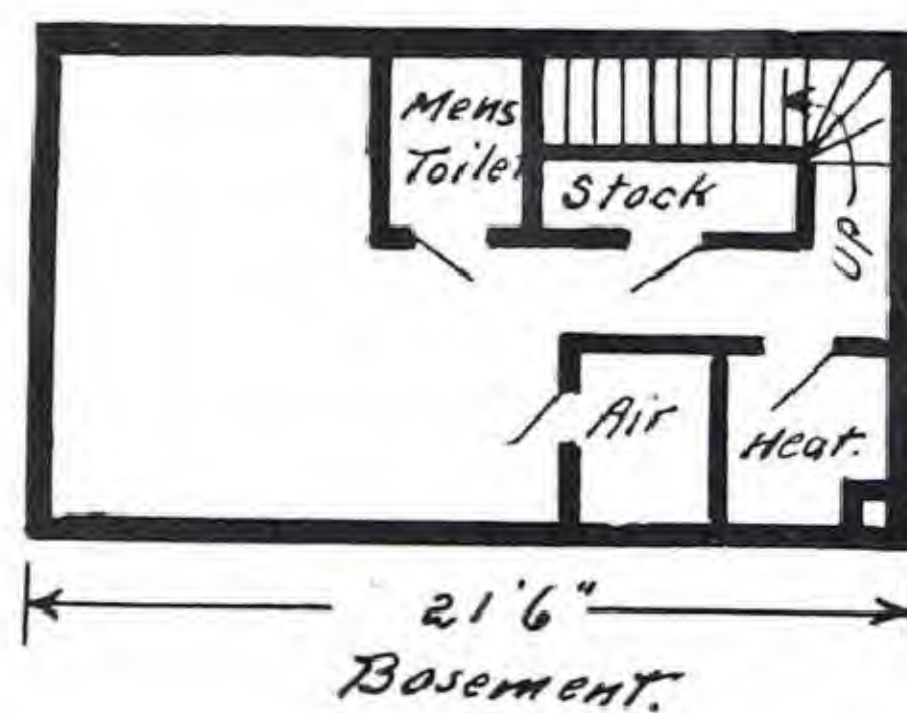
Brick to window sill line, cement finish above. Plaster inside, tile roof, cement floor. Basement with heating plant, air compressor and stateroom.



Bungalow type, concrete floor and metal tile roof; walls of white stucco on hollow tile with mission wood trim. Inside plaster with mission wood trim. Beam ceiling.



First floor



Basement



Fireproof construction. Brick to window sill line, balance stucco on hollow tile or brick. Concrete floor. Built up gravel roof.

Every tank should be carefully strapped before being installed and a table calculated to show contents for each quarter inch in depth. For accurate accounting, it is of vital importance that the tank be installed absolutely level.

Several manufacturers are putting out a tape fitted with plumb-bob or weight on the end and with a specially prepared surface which makes the exact height of the gasoline easily obtainable.

The gauge may be graduated to quarter inches instead of gallons. One gauge will then do for all tanks at a station as well as the trucks or wagons serving that station.

The tanks should be gauged before the opening of business in the morning and the meter readings of each pump taken, all of which are to be entered on the daily report sheet and they should agree with the gaugings and readings taken at the close of business the night before.

This operation should be repeated when the relief comes on at lunch and again when the relief leaves after lunch, and again when the relief comes on for the night meal, again when they leave and also when the station closes at night. All sales should be noted on the report sheet. When a load of gasoline is received at the station, the tanks into which it is to be placed should be gauged and the truck tank gauged before the operation of discharging the load is begun and again after it is completed. These figures should be entered on the daily report sheet and also on a duplicate receipt, one copy of which is taken by the truck driver and one held by the station attendant.

The amount received during the day should be added to the gauge reading as taken in the morning.

The gauge reading taken at night is the amount then on hand. This, subtracted from the above total should be equal to the difference between the meter readings as taken night and morning and also be equal to the gallonage as shown on the sales sheet and also to the cash in the drawer.

Lubricating oil is, of course, not subject to any change in volume due to changes in atmospheric temperature and should check out exactly. In a great many cases, these oils are dispensed through a pump without a meter. In such cases, the checking is dependent on gauging of the tanks, the stock received, sales sheet and the cash.

The general method of checking should conform to that outlined for gasoline.

Shortages in gasoline and oils at filling stations appears to be about equally divided between actual dishonesty and the lax methods of accounting and there is no question but what lax methods of checking and accounting throws open the door for temptation which, in turn, usually leads to dishonesty.

Women as Attendants

In discussing women as attendants at Filling Stations, we do not propose to lay down any definite policies or give a lengthy psychological treatise as to the relative advantage or disadvantage over men attendants. There are numerous

phases of the problem to be considered. This particular aspect of filling station operation can best be comprehended by sighting cases and conditions under which it has been tried out and the results have been good and others where they were somewhat negative.

During the period of the War, it was found necessary by a number of companies to replace attendants either with men past middle age or with women. In a great many cases the men were hard to secure as they could obtain much higher wages in other fields.

One company established a school and engaged women ranging from 18 to 25 years of age. After they were considered sufficiently trained, they were sent out to the Filling Stations. At the outset, they placed from one to four to a station. This did not give very satisfactory results for several reasons. Where three or four were at the same station, they were extremely hard to discipline and refused to take their work seriously. When trade slackened down for a few minutes, instead of seeing that the station was in order and their accounts correct, they would go into a social session, usually sending out for ice cream or other refreshments. The result was that when a customer came in, each one expected the other to serve him, or one girl, more conscientious than the rest, would do the major portion of the work.

It also developed that a great many men, rather than have a woman raise the hood, pour in oil, etc., would do it themselves and rather than wait on themselves to this extent and get their hands all dirty, they would go on to some other station.

Somewhat better results were obtained later by placing the women at the stations where men were employed, but this also was found to have several drawbacks.

Another company carefully selected a number of women ranging in age from 25 to 40. They were women of a fair education, had a pleasing personality, possessed some executive ability, were neat but not loud in their dress and old enough to understand just what they were there for.

They were carefully schooled for several weeks in questions of station management and then placed at various stations as managers and cashiers. They were paid a good salary; their duties consisted of managing the station and handling the money. They did not wait on the cars, but were given from one to four boys ranging from 16 to 18 years of age. In some instances, these boys were colored. They were always in uniform and obliged to keep themselves neat and presentable. They took off gasoline and oil tank covers, raised and locked hoods, served the gasoline, oil, water and air.

The woman manager made all entries on the daily report sheet, received all money and made all change, and checked the gauging of all tanks and the reading of all meters, thereby securing greater accuracy and also making sure of the fact that a customer's hands would never be soiled by receiving greasy money.

Women are naturally better housekeepers than men. As a result it was found that when business was a little slack that she kept the boys busy cleaning up around the station, washing windows, trimming the lawn and in winter keeping the drives clear of ice and snow.

Several of them became very proficient in demonstrating and selling lubricating oils.

The cases where the women were carefully picked and carefully trained, there seemed to be very little cause for complaint. It usually developed that the combined salaries paid to a woman and two boys was somewhat less than that paid to two men.

Handling of Money

During the past eighteen months, it has been sort of a fad for automobile bandits and other highwaymen to hold up or rob filling stations. They usually take place between 10:00 o'clock and midnight or later.

It has developed that several supposed robberies were actually conceived and carried out by the attendant or their accomplices. This proves conclusively that all attendants should be under bond.

Two or three of the larger oil companies are carrying burglar insurance on all stations. Insofar as it is possible, all money not actually necessary for making change should be removed from the station to a place of safety before dark.

If a cash register is in use, each sale should be rung up as soon as it is completed. All money should be taken from the cash register at the close of the day's business.

If a safe is installed in the building, it should be securely anchored to the floor by iron bolts imbedded in the concrete and passing through the bottom of the safe. As an additional precaution, the legs of the safe may be imbedded in concrete.

Wall safes have also been tried by one company. Some of these were located on the first floor and others in the basement. Although none of them have been burglarized, they are not considered as affording any greater protection than the ordinary type of safe.

It is generally conceded that the most satisfactory way is to use a one-drawer cash register with individual keys. All surplus money to be removed from the building during the daylight hours. At the closing of the station for the night, the balance is to be removed or placed in a good safe properly anchored. A light should be kept burning all night so that the safe can readily be seen from the outside of the building.

Competition

Regardless of whether you are preparing to build one or more Filling Stations or are already operating them, you must at all times expect and be ready for competition. If any particular section of the city has an unusually attractive gallonage and only one station to serve it, it will be invaded by at least one other company who will naturally take over a part of this gallonage.

Just what percentage of business any new station can or will take from an established station is dependent on the general arrangement and attractiveness of the station itself; likewise the products handled and the service given. The old rule of business will still hold good. Of two competitive stations in any particular locality, the more progressive one will ultimately control the major portion of the business.

Conclusion

In an article of this character, it is only possible to touch the various headings very briefly and a great many items must, of necessity, be left unmentioned.

However, there is one matter of vital importance which we neglected to speak of in the first or second sections. This pertains to matters during the period of construction, regardless of whether the work is done by a contractor or the owner. A blue print or other plan of the property should always be on hand and should have plainly marked upon it the exact location with the necessary measurements of all sewer pipes, water pipes, gasoline or oil pipes and tanks, air pipes and electric wire conduits.

We have known of hundreds of dollars being uselessly spent in digging and tearing up concrete and other pavements because no one knew just where a pipe or tank was located.

If you are operating a station and it is not a financial success, do not either condemn it to be closed or continue to operate it blindly. Analyze it carefully from every possible angle. Study its location in the community, the size of the lot, the location of the driveways, the kind and position of the building, its attractiveness, the type and location of your equipment, the grade of goods you are handling, the service you are giving the automobile driving public and the class of attendants whom you employ.

Study your competitors. The chances are that you will find the answer and be able to put it on a paying basis by a reasonably small expenditure. If you are going to build a new station, remember no matter how good your own ideas may be, they can always be improved and rounded out by men who have made station planning and operation a study and perhaps spent thousands of dollars in obtaining their experience. They can help you get the value of every dollar you put into it; reduce the operating and maintenance expense to a minimum and at the same time, enable you to build in such a manner as to yield you greater returns.

As a part of our policy of endeavoring to better the filling station business, any advice or suggestions relative to the construction, operation or the examination of plans or ground layouts of proposed filling stations will be gladly and freely given. However, in order that we may be able to intelligently assist you in solving your problems, we must be given specific information and other necessary data pertaining to the question.

Complete Filling Station

GAS PUMPS—Wayne builds gasoline pumps for every need. Wayne pumps in capacities of from one to ten gallons range from the simple one-gallon outfit for inside dispensing to the beautiful Ionic columned Model 492. Models 275, 276 and 278 meet the different requirements of the five-gallon piston type pump. The 490 series permits the choice of either a five or ten-gallon visible air or hand operated pump of the newest design and greatest mechanical perfection. There are many other models, including the new 711, the finest 10-gallon visible pump selling at a popular price. Model 276 stands far above any other blind pump in simplicity, service and dependability.

LUBRICATING OUTFITS—Models 35 and 81, dust and dirt as well as rain proof lubricating outfits are equipped with accurate measuring quart pumps. Model 35 is the rectangular type built in from 1 to 5 barrel capacity. Model 81 has a round tank and is furnished in the 1 barrel size only. Model 320 is the curb type for use with underground storage tank.

AIR COMPRESSORS—Model 2000 is a two stage compressor, quiet and vibrationless and automatic in every feature. Furnished as shown or without tank for either belt or motor drive.

Wayne Tank and Pump Company

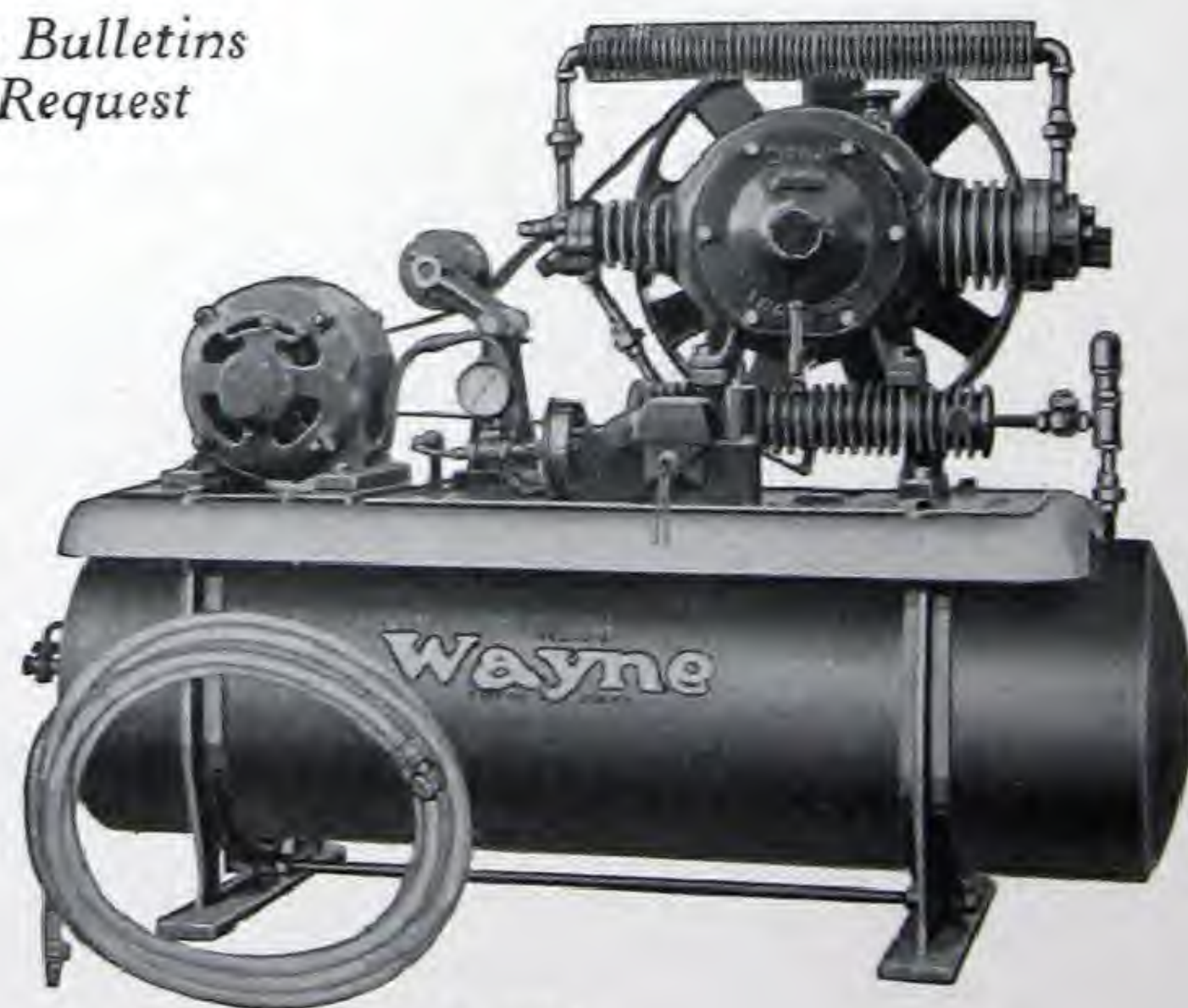
*Descriptive Bulletins
Sent on Request*



Model 492



Model 15-A



Model 2000

Equipment Made by Wayne

AIR TOWERS—Model 15-A adds materially to the attractiveness of the station besides providing a vital service. Both air and water can be supplied without moving the car.

WATER SOFTENERS—Wayne Water Softeners are finding more and more demand among filling station owners. The advertising of Wayne Soft Water which will not scale the cooling system of the automobile provides an added service which attracts and holds trade.

OIL BURNERS—The question of heating filling stations has been solved for the oil companies by the general introduction of the Wayne Oil Burner. The Wayne Tank and Pump Company, with 34 years of experience in manufacturing kindred equipment, offers you a proven burner, ideally adapted to filling station use and guaranteed direct by the manufacturer.

WAYNE TANKS—Made in our own tank shops to rigid specifications, meeting Underwriters' requirements, Wayne light and heavy metal tanks are everywhere recognized as of the highest quality and the longest life.

Fort Wayne, Indiana, U. S. A.

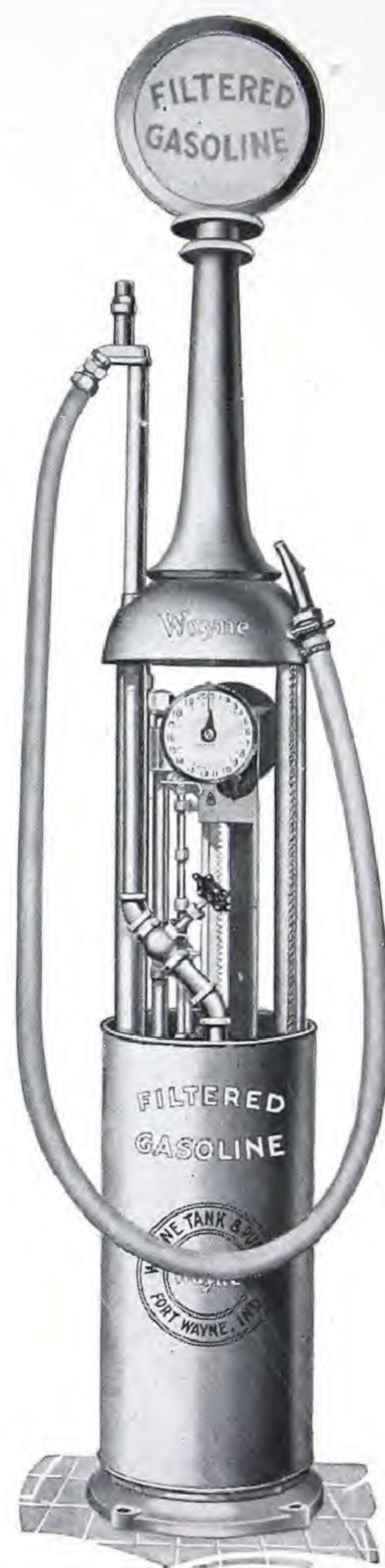
*Address Our
Nearest Office*



Model 35



Model 320



Model 276

Wayne Service

Wayne is an international organization maintaining branches, sales offices, warehouses or service stations from coast to coast and in the principal cities of foreign countries. Backed by thirty-four years' experience in the design and manufacture of gasoline and oil handling equipment, the word Wayne is the symbol of satisfaction throughout the world. For literature, prices and detailed information address our nearest office.

Branch and Sales Offices in United States and Foreign Countries

ATLANTA	1221 Candler Building
BOSTON	Room 506—110 Tremont Street
BUFFALO	505 Ellicott Square Building
CHICAGO	32 West Lake Street
CLEVELAND	1833 East 13th Street
COLUMBUS, OHIO	607 First National Bank Building
DALLAS	1905 Commerce Street
DENVER	311 Colorado Building
DES MOINES	801 Equitable Building
DETROIT	23 Parsons Street
KANSAS CITY	1828 Grand Avenue
LOS ANGELES	135 West Washington Street
MINNEAPOLIS	122 South Ninth Street
NEW YORK	1780 Broadway
OMAHA	1901 Harney Street
PHILADELPHIA	4030 North Broad Street
PITTSBURG	20 Wood Street
ST. LOUIS	707 Boatman's Bank Building
SAN FRANCISCO	430 Fourth Avenue
TORONTO	165-187 Dufferin Street
LONDON	Ingersoll House, 9 Kingsway W. C. 2
SYDNEY	160 Castlereagh St.

Wayne Tank and Pump Co.

Fort Wayne, Indiana, U. S. A.



Main Plant and General Offices—Wayne Tank and Pump Co.